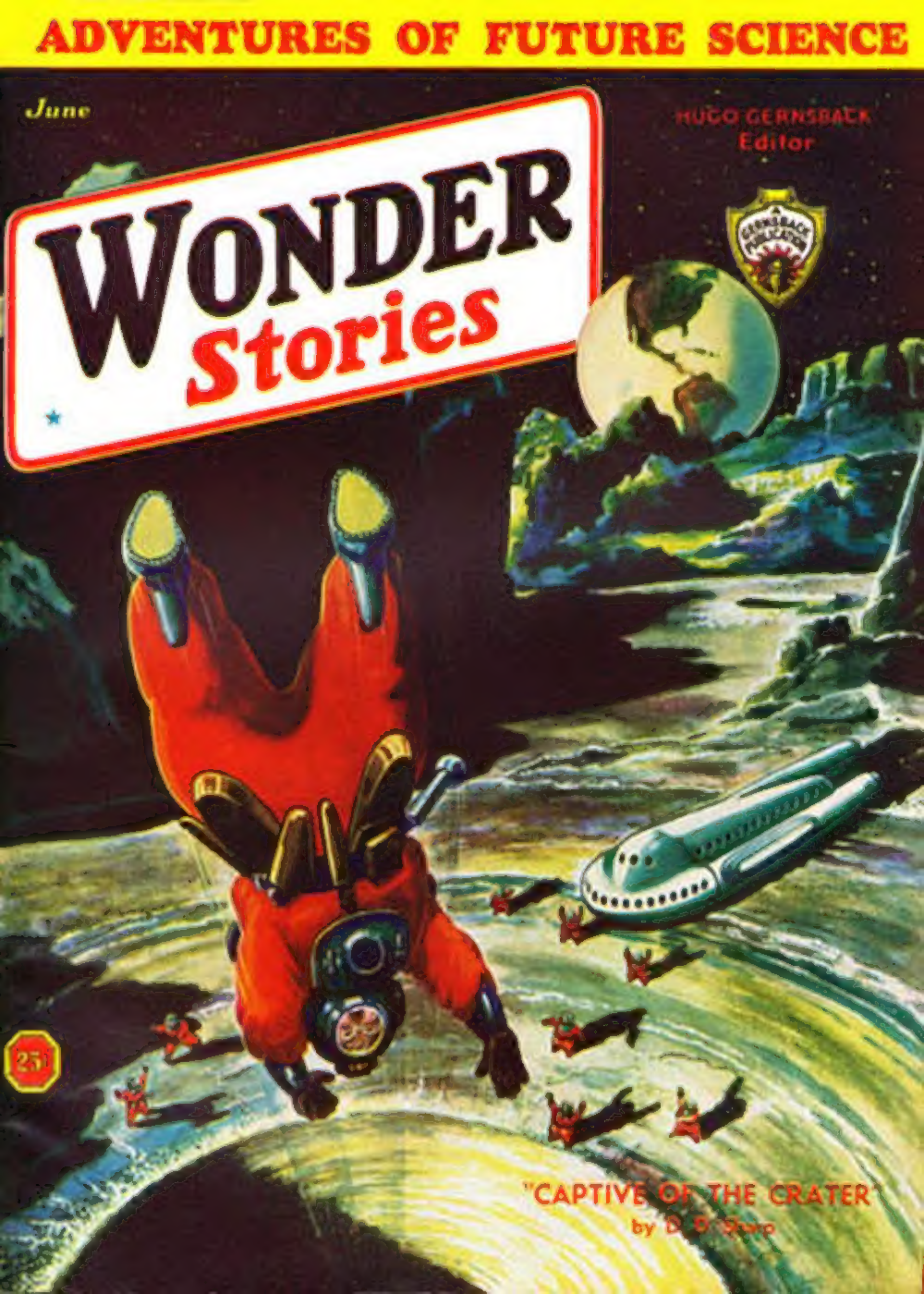
ADVENTURES OF FUTURE SCIENCE

June

HUGO GERNSBACK
Editor

WONDER Stories



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The Magazine of Prophetic Fiction

WONDER Stories

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ON THE COVER THIS MONTH

taken from D. D. Sharp's "Captive of the Crater" we see the captive rising above the tunnel entrance, ready to fall back into the moon's interior on his eternal pendulum-like motion. Below is the space ship, and his companions watching helplessly.

Published by STELLAR PUBLISHING CORPORATION, H. GERNSBACK, Pres., S. GERNSBACK, Treas., I. S. MANHEIMER, Sec'y.
Publication Office, 404 North Wesley Avenue, Mount Morris, Illinois. Editorial and General Offices, 96-98 Park Place, New York

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WONDER STORIES is published on the 3rd of the preceding month. 12 numbers per year, subscription price is $2.50 a year in United States, and its possessions. In foreign countries, exclusive of Canada, $3.00 a year. Single copies 25c.

Address all contributions for publication to Editor, WONDER STORIES, 98-98 Park Place, New York. Publishers are not responsible for lost MSS. Contributions cannot be returned unless authors remit full postage.

WONDER STORIES is for sale at principal newsstands in the United States and Canada.

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EDITORIAL PAGE

JUNE, 1933

Volume 5 Number 1

WONDER Stories

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WONDERS OF TOUCH

An Editorial by Hugo Gernsback

● The simpler that things seem to us because of our familiarity with them, the more difficult they become when we try to analyze them.

Touch, the *tactile* sense, is one of these, and it is not such a simple thing as we believe it to be. It is wonderfully complicated.

Of course, the sense of touch is distributed over the entire human body, as is well known. It should, however, be distinguished from other varieties of common experience, such as pain and temperature sensations; and, while these are perceived through the same nerves (that is, the *sensory* nerves) the nerve fibres identified with the sense that we call touch are provided with special terminal organs. Moreover, this sense is properly exercised only in those parts where there is an abundance of special so-called "end organs." There are two kinds of these: the *"touch corpuscles,"* which lie chiefly in the skin; and the *"end bulbs,"* which are found mainly in the mucous membranes.

The sense of touch is far more sensitive than you might think. Besides, it is possible to cultivate the sense to a high order. The blind, for instance, use their finger tips in a far different manner than those who rely on their eyes. The sense can become sharpened so remarkably that a blind person can read a heavy impression of an ordinary printed page without the well-known Braille method. In other words, the relief impression made by the type is sufficient for such blind persons to read the printed page with their finger tips.

Nor is the sense of touch confined only to solids. Differences in barometric pressures can be perceived by certain individuals, from their effect on the skin.

Which part of the body is most sensitive, as far as touch is concerned? You might think the finger tips, but such is not the case.

Acuteness of sense of touch has to do a great deal with the blood supply, rather than with the skin. This again is largely influenced by the surrounding temperature.

The acuteness of touch itself is often measured by the instrument known as the Aesthesiometer, which consists of two needle points, which extend from two movable arms which are connected with a graduated scale. A pair of compasses may be used in the same manner. The closer together the needle points can be *separately* perceived, the greater the delicacy of touch. The distance at which the two points can be separately distinguished by the subject on various parts of the body may be better understood from the following:

	Millimeters
Tip of tongue	1.1
Tip of nose	6.6
White part of lips	8.8
Back of hand	29.8
Back	66.0

From this, it will be seen that the tongue is the most sensitive part of the human body to touch, and the back, that is, the region of the spinal column the least sensitive.

It is certain that the human being has not a very acute sense of touch. Certain animals and insects are known to have a far more acute sensory organization; and it is thought, for instance, that the antenna of insects is one of the most acute sensory organs that we know of.

There may, however, be others even more sensitive, and a number of scientists believe that, for instance, bats possess a sensory organ so sensitive that we can have no conception of it. It has been found that bats completely blinded, by depriving them of their eyes, can still find their way about in a room criss-crossed with fine wires which the bat can, of course, not see. One might think that perhaps the sound-vibrations of its wings beating against the wire would be reflected and the bat would thus hear the echo, but this theory is not tenable because bats deprived of both eyesight and hearing still find their way about such a room without ever touching a wire or hitting the wall. Scientists have, therefore, come to the conclusion that the bat perceived the nearness of the wire or wall by means of its sensory organs underneath the wings, in a way not understood clearly today.

We all know of optical illusions; but very few individuals are aware that there are tactile illusions as well. You can easily make the following experiment and satisfy yourself as to that point. Twist the index and the third finger so they cross each other. Take a marble and place it between the fingers at the point where they cross. Roll the marble between the two fingers while they are crossed. If you close your eyes, you will be positive that you are actually feeling two balls; and only by looking at the single ball can you bring yourself to believe that there is only one there.

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(Illustration by Paul)

With the immense panorama of the empty Place de la Concorde spread before them, Mazelier suddenly gripped his assistant by the arm. To the flamboyant red of the skyline there succeeded an orange light.

THE RADIO TERROR

By EUGENE THEBAULT

Translated from the French by Fletcher Pratt

● This unusual story, which we have imported from France, and had translated by our well known friend Mr. Pratt, deals in a realistic way with some of the fascinating and dangerous possibilities of electromagnetic waves.

We are just becoming aware of the universal influence of the electromagnetic spectrum on our lives. From radio down to cosmic rays, we are walled about by ceaseless bombardment of radiations. And we have been told that even matter itself is made up of such electromagnetic vibrations.

If some of the events in this breathless story seem fantastic, we must remember that we know, as yet, very little of the invisible world of radiations. And perhaps, some day, scientists will be able to duplicate the amazing things of our unknown inventor.

● On the 18th of October, 1952, the weather in Paris was marvelous, and numerous groups lingered along the boulevards in the early afternoon to yield themselves lazily to the caresses of autumn.

At the Place de l'Opera a great crowd had gathered before the perfected loudspeaker which had just been installed there for the benefit of the public. Its powerful voice dominated the clamors of the traffic which rolled unceasingly past like a triumphal parade.

The loudspeaker, with a clarity and tone that delighted the assembled public was reproducing the sounds of a cleverly assembled concert in which eight educated dogs, three elephants and a dozen performing parrots were performing a rendition of Beethoven's Ninth Symphony. The eight dogs were in London; the three elephants were in Calcutta, where one of them was tooting a trombone, the second a bassoon, and the third a *hautbois* especially constructed for this gigantic and rather unusual performer. The dozen parrots sang (if one could call it that) from Buenos Aires; and everything had been arranged by the world radio commission so that all the different members of this extraordinary choir could be heard by wireless enthusiasts in any part of the universe.

As a matter of fact, the reception was all one could hope for. The elephant *hautbois* player had just finished a solo, executed with deafening virtuosity, when all at once, the thread of the animal concert was broken, to be replaced by an absolutely insupportable sound of frying.

"Well!" remarked someone, "what's going on? I don't seem to be able to understand the words any more."

People laughed, imagining that the disagreeable sounds were part of the program.

A blonde midinette, declared gaily:

"I know what it is; they've tuned in on some pigs asking for their soup."

"It's extraordinarily well imitated," affirmed a young radio enthusiast in a tone of conviction.

Suddenly, the sound of frying ceased, and after a few seconds of incomprehensible silence, a voice came from the loudspeaker, a sharp, dry, tearing voice, but so clear that every syllable enunciated was heard.

"Listen!" said the voice, "Listen! The world is coming to an end!"

A burst of laughter greeted this announcement. The first speaker cried:

"Is that all?"

A serious-looking gentleman shrugged his shoulders. "Wait. A new publicity trick," he explained.

But the voice in the loudspeaker began anew, trembling with vibrations of hate and anger:

"Listen! I, whom you do not know and who hate and despise all of you, announce that I have found a method of annihilating mankind and destroying the world! Listen! In an hour the world will be destroyed! In an hour, do you hear? Nothing will exist any more, neither you nor the earth that supports you! I am the master of unknown forces and of waves possessing an infinite power of destruction. I am the master, the only master of the universe! And I desire that the universe shall perish."

The only result of this emphatic speech was to raise an even greater hilarity.

"Too bad," shouted the joker, "that I didn't know about it three days ago. It would have saved me paying my rent."

A tall young man who was tranquilly lighting a cigarette chipped in:

"—And with me getting married next week!"

And the midinette added:

"The radio's a bore today—just when the animal concert was going so well, too! Somebody ought to call up about it."

The general opinion seemed to be that some practical joker was amusing himself at the expense of the crowd. But the crowd did not go away; everyone waited for the words that would show what the clever speaker was advertising. The cloudless sky held an autumn sun so warm that everyone felt amused and indulgent; at certain times of year it takes very little to please Parisians. The loudspeaker began again:

"I hate humanity and I have condemned it. All human beings are criminals; they injure themselves, they kill each other, they deserve to be punished. I, who speak to you, I, against whom you can do nothing, I, who can do everything, am going to precipitate all of you back into the nothingness from which you should never have emerged! I am going to give you a proof of my power. You see what time it is? Look at your watches; in ten minutes the sun will disappear; the shadows will cover the whole earth and become thicker and thicker; no light at all will be able to shine in the night that I create . . .

"Listen! Listen! In twenty minutes a glacial cold will replace the present warmth. Your limbs will be paralyzed and then you will begin to believe what I tell you. I hate you, all of you, you living people, who, in an instant, will be nothing but so many corpses. Your bodies will not fall to dust—they will be annihilated! Have you never thought what it would be like—not to exist? Well, you have fifty minutes to prepare yourselves for it."

● A frightful laugh, amplified by the loudspeaker, sent a tremor through the crowd. The voice continued:

"I hate you. I wish your agony could last for centuries. But in fifty minutes no living thing will exist any more."

The voice fell silent; a silence filled almost with agony. But the clear laughter of the midinette dissipated the general sensation of terror.

"I have it!" she said, "It's an ad for a fur company! If it weren't so warm, I'd take my 30,000 francs and buy me a moleskin."

The serious gentleman added:

"The joke is in bad taste. Why don't the police do something about it?"

Nevertheless he pulled out his watch and glanced at it, an action imitated by the major portion of the hearers of this unlikely discourse. Then, as though in spite of himself, he looked at the sky.

Not a cloud! The benevolent sun shone down on them, reassuring and magnificent. Decidedly, the midinette's idea was the most likely explanation of this unexpected and ultra-modern method of getting people's attention.

All the same, in this crowd which remained so skeptical and so little moved, there was one person who seemed to take this incredible announcement hurled on the ether, apparently by some melancholy joker, at its face value. It was a young man of some twenty-two years, who wore the smock and cap of a Parisian laborer. His thin, serious face bore an expression of the keenest attention, as making play with his elbows, he worked as close as possible to the loudspeaker and waited to hear it again. But no one paid any attention to the growing surprise and fright that spread over his visage.

The Place de l'Opera was black with people, and hurrying crowds of the curious overflowed down the boulevards, filling the Rue de la Paix as far as the Place Vendome, flowing down the Rue Auber and into the Rue du Quatre-Septembre, growing larger every second through all the streets where one could hear the voice of the loudspeaker. Th clever merchandiser who had thought of this scheme to advertise his wares, had certainly attained his object! He must have been a clever psychologist to thus play on idle dolts with a display of superior doltery.

Meanwhile, a good many of the strollers, thinking the show was over and that the interrupted concert would hardly be resumed, began to go their separate ways when the loudspeaker began again.

"Watch!" clamored the gigantic voice, "watch the sun! It is going to darken, and in two minutes the cold will begin."

At these words the young workman made desperate efforts to get away. He succeeded in escaping from the crowd, got around the Opera House, and raced as fast as his legs would carry him down the Rue Auber. It was time; there was a terrible surge among the mass of people and cries of fright rose from all sides. A sinister shadow, like that of an eclipse, spread rapidly from west to east, hiding the sun and then spreading rapidly across the heavens to plunge the whole city into a nightmare dream. And in every direction, propagated by terror with the speed of an electric current the news that a frightful and inevitable catastrophe was upon the world spread through the city, invading every district, racing down every darkened street.

In the sudden obscurity there was the wildest disorder. As the voice had predicted, it was impossible to light either electricity or gas; and in the crisis produced by this abnormal night, no one thought of taking steps to insure order and quiet movement—not that any such steps would have been of the slightest use.

In that wild crowd of men and women who had suddenly become the prey of an inexpressible horror, nobody had the cool-headedness even to think of the supernatural individual who had boasted of being able to destroy the world and who seemed in a fair way to do it. Everyone thought of the horror; no one of its author.

Was the unknown really going to realize his terrible prediction? And in destroying the earth and all its living beings would he not destroy himself as well? Was the same thing happening all over the world as at Paris? So many problems, so many questions—and no one able to answer them, all were incapable of intelligent thought. The movement in the streets and boulevards was completely halted, an agonized silence weighed down the crowd, as everyone heard only the oppressed breathing of his neighbor.

Suddenly cries of despair broke forth, heart-rending appeals, wails, shouts of rage and the dumb sound of blows, revealing the combats for life the dark concealed. It was for anyone who could to make his way through the crowd by main strength, to find his way through the opaque black toward his home, there to exchange a last farewell with his family before plunging into nothingness. The prediction was being realized; a brief and final agony was beginning for the human species, brief, but so terrible that seconds seemed to last for centuries.

Once more the voice of the loudspeaker rose above the crowd, sarcastic and insulting:

"Everything I promised you is really going to happen. . . . Now prepare for the cold! The polar cold, which you would not be able to resist even if I should renounce the joy of destroying the earth and all its inhabitants. In a few minutes, in a half an hour at most, there will be no more people alive."

And in fact it was as though an icy blanket fell suddenly upon Paris. Then, after a few seconds the cold was accentuated, it became so bitter that no one among the victims of the diabolic unknown had even the strength to shiver. In an absolute silence, like that of the tomb, in a night as profound as that of the sepulchre, the loudspeaker counted the last moments of the world, before it should be re-absorbed in the infinite.

"Still ten minutes more! . . . Five minutes more!"

Near the loudspeaker a single soft voice rose in a sobbing plea:

"My God!"

As though the prayer had been heard, the enemy of the world cried from the loudspeaker:

"Two minutes more—and the world will be destroyed!"

CHAPTER II

The Helium Lamp

● At the exact moment when the crowd in the Place de l'Opera was finding itself much amused by the concert of the dogs, the elephants and the parrots organized by the three amusement trusts of London, Calcutta and Buenos Aires, the engineer Gribal was preparing to leave his little apartment on the Rue Boissy-d'Anglas. His wife, daughter and son were meanwhile listening in on the performance.

When little Roger, a lad of fourteen, saw his father take his hat and start toward the door, he called out, in a tone of regret:

"Oh, papa, it's a shame you have to go. The elephants are simply wonderful; the one with the *hautbois* just made a trill in *sol!* Didn't he, Paulette?"

Roger's sister, whose eighteen years conferred a musical sense a little less uncertain than that of her brother, corrected him with a smile:

"I think the *sol* was a *re*. But it's true that the elephants are good."

Roger protested:

"A *re!* Never! Women have no ear for music!"

Having delivered himself of this sage maxim, Roger took up his headset again, for the radio in Gribal's apartment, an improvement on the usual models, rendered to perfection the sound of the instruments and voices which are always a little distorted by a loudspeaker.

Mme. Gribal, a little less interested than her children in the virtuousos of Calcutta, laid down her listening helmet to say to her husband:

"No overcoat? You'd better take one; the evenings are getting quite chilly now."

Gribal laughed:

"Bah," he said, "it's as warm as a summer's day. Don't worry—this is not a good day for catching colds. Run along back to your concert; I'll be back in a couple of hours, anyway. Have a good time."

"Don't get run over."

Gribal smiled. Every time he went out his wife gave him the same good advice. She knew that her husband was always mulling over some scientific problem in his head, and was quite as likely to stop in the middle of the street to calculate a formula as not. But Gribal had two qualities sufficient to protect even a pedestrian in a city—he had a quick eye, and in spite of his forty-two years was as supple and active as a young man of twenty-five; moreover, he was not as absent-minded as he seemed. For he had a sort of double mind; his intelligence went ticking along without in the least interrupting his physical reactions.

And, moreover, what was there to fear? He worked hardly two doors from where he lived, in the Avenue Champs-Elysees, at the Office of Scientific Research, a bureau of the new Ministry of Science. And he had a good position; he was at once the disciple, the friend, and the main reliance of the director of the office, the celebrated Mazelier, the great scientist whose discoveries for the last two years had been upsetting the usual concepts of physics and chemistry.

Gribal had to go up the Champs-Elysees as far as the Rond-Point. He walked gaily along, filled with the joy of life, tasting the sweetness of the exquisite autumnal day which seemed meant for a holiday. The engineer, naturally, knew nothing, and could suspect nothing of the drama which was proceeding only a few hundred yards from him, for the dismal announcements of the loudspeaker reached him only as an indistinct murmur. Therefore his surprise was extreme when, as he arrived at the door of the office, he saw the sun suddenly darkened, and the shadows descended rapidly upon the city.

At first he thought:

"What's this? Night already? My watch must be decidedly slow."

But as rapidly as lightning another reflection crossed his mind. It was hardly half a minute since he had glanced at the Arc de Triomphe, bathed in sunlight. The sun was still high above the horizon. No doubt possible; his watch was not slow. But then, what did this sudden darkness mean?

Naturally Gribal was in the habit of searching for a scientific explanation for every phenomenon he observed. This time, to his astonishment, he could not find any.

His stupefaction was such that he expressed it aloud:

"This is too much; I don't believe it," he remarked.

And like any other scientist with a theory upset, he added:

"It's incomprehensible!"

The event that produced such a statement was surprising indeed, for Gribal held it as a fundamental principle that the human mind was capable of understanding everything, and as a consequence accomplishing anything. But, for the moment there was nothing for it to accomplish. Alone in the Avenue des Champs-Elysees, whose habitual and joyous noises had given place to the silence of the tomb, he was ready to admit that he was dreaming wide awake, and that some kind of an absurd delusion was in possession of his brain.

Suddenly there was a voice at his side, a voice vibrant with inquietude, and which he recognized without difficulty:

"It's you, Gabril? Quick, quick, come here!"

"Ah, you're there, M. Mazelier? . . . What the devil is going on, anyway?"

● Gribal felt much reassured. Mazelier was there! The explanation of the phenomenon would not be far behind him. But without replying to Gribal's question, the director of the office repeated, in a voice dominated by a kind of terror:

"Quick! Quick!... For heaven's sake, hurry, Gribal!"

"Wait. I can't see a damned thing. I'm going to light a match."

"No use. Your matches won't light. Here! Take this."

A feeble light, then another, burned suddenly in the shadows. Gribal could make out the face of his chief as he handed him a little torch of singular shape.

"It's a helium lamp," said Mazelier, "the light is resistant to the influence of most kinds of waves. Fortunately, I had a couple with me. But quick, open the laboratory door. You have the key, haven't you? Quick, quick! We haven't a second to lose."

When such a man as Mazelier made a display of uneasiness, there must be some danger both grave and immediate. Gribal ceased asking questions and began acting He hurried along after his chief, bearing like him, the providential lamp. The two ran through the complex corridors of the laboratory. The sound of a voice was

audible, issuing from a loudspeaker placed at one side—the same voice that was carrying terror to all Paris, and doubtless to all the world beside. Gribal paused a moment to hear and grasped a part of the truth. A madman—it could only be a madman—in possession of a frightful power over matter, had conceived the project of annihilating every existing thing.

"In fifty minutes," clamored the voice, "it will be all over with humanity."

Fifty minutes! The threat had the curious effect of providing Gribal with a clear head and a confidence in his own and his chief's powers. With Mazelier, they would need fifty centuries!

"Ah," he said to Mazelier, "what can I do to help you?"

For he was certain that Mazelier would save the world.

The scientist, leading the way, without halting crossed the laboratory proper, where he labored daily surrounded by the juniors of the office. He pushed the door of an inner room where no one was permitted to enter, not even Gribal, who was to a certain extent the depository to whom Mazelier confided his theories, his experiments and his secrets—to draw them forth again, refreshed and altered by the clear intelligence of the engineer.

In this inner room Mazelier put into practical application his most audacious theories and constructed many pieces of apparatus that had never reached the outer world. But he was a somewhat secretive character; some of his experiments he never mentioned, even to his faithful collaborator, before being certain that the experiment had reached a dead end or would be one more of those successes for which he claimed so little personal credit.

In the latter case, he was in the habit of taking the successful piece of apparatus into the general laboratory, where he revealed its mysteries, and complacently answered the questions of his subordinates. Gribal had never quite dared to question him on what he kept in this mysterious inner room.

He hesitated therefore, at the door of the forbidden chamber, when Mazelier called him:

"Come on, my friend, come along."

Gribal went into the sanctuary, which was sufficiently illuminated by the two helium lamps to make objects visible. To his extreme surprise, he saw no extraordinary pieces of apparatus; there was no arsenal of the sorcerer of modern science he had expected to find. There was only, alone in the whole room, a little table on which was mounted a brilliantly polished sphere of metal—a sphere of copper apparently. Two round legs bore a double ring which encircled the sphere; and in each corner of the table were dials and a maze of little levers; before the sphere itself another dial with a needle on its face indicating the zero point on a scale whose purpose was obscure. That was all. Gribal dared not say, though he thought, that this seemed a very slight apparatus with which to combat the terror of the unknown. But he had not followed his chief to make an argument; he was there to help and to obey.

Feverishly, Mazelier gave the example. He bent busily over the apparatus, his forehead furrowed with frowns, breathing hard. Gribal had never seen him like this before.

Without a word, Mazelier worked one of the levers. As he closed some connection a musical note, low and sustained, came from the sphere, as though it were turning within its supports like an enormous top. But Gribal could perceive that the sphere remained perfectly unmoved. The scientist touched another lever; the sound became sharper and sharper, soared beyond the limit in which the human ear could follow its vibrations. He moved the running members. Suddenly to the sharp, almost intolerable shriek, there succeeded a hammering like the rapid fire of a whole battery of machine-guns. The needle on the dial oscillated, and Mazelier, bending over it, followed its course. It must have satisfied him, for the expression of strain left his face and a sudden flash of pleasure streaked across it.

● All the feverishness had disappeared from his motions. He seated himself tranquilly before the little table, and said, in the quiet voice which was his usual manner of speaking.

"Do you know where the enemy of the human species is, Gribal? Not two kilometres west of where we are! Between Passy and the Etoile."

Gribal started and said:

"Can't we do something? Call up the police? Warn the people?"

Mazelier smiled:

"My friend," he said, "begin your researches by saying nothing to anybody. To anybody, do you hear? For I do not wish to have to regret confiding in you. And then reflect—this fiend could realize his threat, or at least cause a terrible catastrophe, long before you could find him. I can deal with him more easily from here—perhaps."

An icy hand gripped Gribal's heart. "Perhaps!" His chief had said "Perhaps." Then he was not sure of winning out. The engineer dared to ask:

"I hope you don't believe in the threats of that lunatic?"

Mazelier's reply fell into the little silence:

"Humanity has never been in greater danger. Never! But leave me alone now—I can work better. I still have a half-hour to do what can be done. It's more than I need . . . but at a certain moment the defense must move as rapidly as the attack, and you are holding me up. Run along, Gribal; I will try to do it alone."

Gribal could not conceal his emotion:

"My duty is to watch over you," he declared.

"No, no, Gribal. I am running no more risks here than anyone else is running anywhere in Paris. Your duty is to go back home and reassure your family. They must be worried. Run along, Gribal, run along. You can find your way with the lamp. But when you get home, turn on your radio and don't lose a word of what you hear."

What would Gribal not have given to assist, even by his mute presence, in that strange duel in the dark between his chief and the invisible enemy of the human race? But Mazelier's orders were not the kind one discusses.

The engineer, alone and a little frightened, was about to leave, when he heard the voice of the unknown—so loud, so close and so clear that Gribal jumped. "Here comes the cold," it said, "the polar cold. In half an hour, at most, there will be no more world!"

It was necessary to admit that the unknown was no liar. Both the engineer and the scientist could remark the astonishing and rapid decline in the temperature.

But Gribal turned back to find Mazelier's calm unruffled.

"Do you notice," his chief remarked coolly, "that it is becoming easier to breathe?"

Even in the hour of peril his spirit of scientific observation did not desert him. Shivering as he was, Gribal dared to pause for a last question:

"How is it you can hear him so clearly in this inner laboratory? Is there a loudspeaker here?"

"Certainly, my friend. That sphere, which you see before you. It's not metal, it is—but, run along, Gribal! I'll tell you all about it later. Leave me, leave me. Don't hold me up any longer."

Gribal left, his heart constricted, realizing that what he had always thought impossible had occurred; a man, or rather two men, in possession of the innermost secrets of matter, the one striving to use his knowledge to annihilate it, the other to maintain it in its eternal form. Human intelligence, then, did it dominate all things to such a point?

Gribal found it difficult to admit. Nevertheless, he was a scientist, and the marvels he was witnessing, did they not confirm the most extreme claims science had made? Why not admit, in that case, that matter was vanquished, the secret of atomic and electronic forces discovered at last?

Such ideas filled the mind of the engineer as he hurried homeward at the utmost speed at which his legs would carry him. He was so busy with them that he hardly felt the cold, which was, nevertheless, enough to freeze the hair on a monkey. He hurried along toward the Place de la Concorde, past the Marigny Square and the Avenue Gabriel, all enveloped in night and silence. Not a voice, not a sigh, not the slightest sound in the immense avenue of the Champs-Elysees. Twenty minutes had hardly gone by since Gribal, from that same spot, had admired the brilliant light of the sun and the incomparable spectacle of the Parisian crowd, gay and moving. What had become of all the strollers, of all the autos that crowded the streets? Paris was deserted.

In the Champs-Elysees the first threats of the unknown, heard at first from the Place de l'Etoile, and in the flicker of an eyelash carried the length of the avenue to the Place de la Concorde, had produced an immediate terror. While Gribal, busy with his thoughts, had been strolling toward the office, walkers, bus-drivers, automobilists, obeying one of those singular mass movements which seize on crowds, had been hastening toward any refuge they could find. What Gribal in his distraction, had taken for the ordinary vigorous movement of the avenue's life had been, in reality, a rout, a flight. And the shadows had descended upon the last fliers hastily seeking refuge in the little cross streets.

Meanwhile, as he felt his way along the Avenue Gabriel toward the Rue Boissy d'Anglas, Gribal looked about him to see whether he could not help some person in distress. But he was alone. The feeble light of his lamp was reflected from no human form. Along here, everyone had fled, while at the Place de l'Opera, the curious crowd, victims of their own inquisitiveness, dared no longer make the least effort to disperse.

CHAPTER III

The Great Illusion

● And it was thus that at a dozen steps from his door, Gribal was seized with a sudden sensation of fear. Would he find his wife and children alive? His wife, Paulette, and Roger? As a scientist, he had faith in the ultimate victory of Mazelier, but as a father, as a man, he feared the worst.

Trembling more with agony than with cold, the engineer hurried into the silent house; the door stood ajar. He mounted the stairs, listening for any noise that would be a sign of life. But one would have said that all the inhabitants of the building were sunk in some supernatural sleep. And Gribal, so anxious to arrive a moment before, now hesitated to unlock the door, nerved himself to the effort and flung it open. At the sound there was a triple exclamation:

"Pierre? Is it you?"

Mme. Gribal, as rapidly as she could in the obscurity, ran to her husband, and Roger, suddenly became joyous and confident once more on the arrival of his father, cried out:

"We're in the front room, papa. Wait till I get this chair out of the way, so you won't stumble over it."

Gribal replied from the hallway;

"Stay where you are. I have a light."

Paulette, in her turn, gave a little cry;

"A light! Then we are saved."

His children were worried no longer; their father was there and he was a scientist.

It was just at that moment that the wave of cold became doubly severe; but nobody paid any attention; there was a babble of rapid conversation and embraces that ended only when Roger questioned:

"Papa, why is it so cold?"

Mme. Gribal remarked:

"You see, we've got all the overcoats and furs in the house on. Wait a minute, I'll get you some blankets from the bedroom to wrap yourself in."

"Oh," said Roger, looking at the helium lamp, "what's that?"

"Don't touch it," warned Gribal.

He perceived with satisfaction that it was unnecessary to reassure them. For Roger, the threatened cataclysm was nothing but an exciting adventure. The words transmitted by the loudspeaker had not frightened him at all, for the simple reason that he had not believed them. As for Paulette, who had been for some time her father's most brilliant scientific pupil, she was too curious to be scared. She asked:

"But father, explain to me why we can't light any matches. There is not a light in the streets, and we can't seem to light any of the fires; everything went out in the kitchen. But we are breathing all the same, just like before. So there isn't any lack of oxygen—but why isn't there any combustion?"

The fact had already struck Gribal; for that matter Mazelier had warned him of it; all matches would fail in the midnight atmosphere. But everyone was breathing, full and deep, as though the air of Paris had become suddenly richer in oxygen.

Meanwhile, if Gribal's family had ceased worrying, he himself felt more and more uneasy as the minutes passed. He replied, almost half-heartedly:

"I don't know how to explain it. We will ask Mazelier"

"Did you see M. Mazelier?"

"Yes."

"Oh, then he must have told you all about it."

Gribal did not think it quite prudent to gratify Paulette's curiosity; and as his children became more and more reassured, his own inquietude, if not his fear, grew greater. The decisive moment was at hand. The prodigious duel would soon be over. But he dared not reveal to his family the existence of that combat, unknown to all but Mazelier, himself, and the mysterious organizer of the catastrophe.

He closed his eyes in spite of himself; then remembered something, and reached for the listening helmet, signing to his wife and children to imitate him.

"Is there something to hear?" asked Roger. "But it's all over, papa."

Gribal insisted;

"Put on your helmets."

"I don't hear anything," murmured Paulette.

"Naturally!" said Roger. "They always cut the most interesting parts. Probably the silly man has gone to get himself warm."

"Do you know?" said Paulette, after a minute, "I think it's less cold than it was."

"Of course," put in Roger, "such a temperature in October is hardly natural. It couldn't last."

At any other time Gribal would have been amused by the superb confidence of his son. How happy the quietude of ignorance was.

Suddenly, the receivers brought the characteristic noise of static that preceded a world-broadcast. Roger remarked:

"Ah, the chap has unfrozen himself! Now he's going to tell us some jokes. You'll see that—"

He did not finish. A cry came to the ears of the listeners, a cry of fury, rage and fright, ending in sort of desperate rattle. And then, a voice which Gribal had no difficulty in recognizing, pronounced calmly,

"The world is saved. Everything's all right. The danger—"

The sentence was interrupted by a sound which no human being could analyze correctly; resembling, more than anything else, a million electric discharges letting go at once. Then came a complete silence. Gribal imagined that his radio was out of order, some essential part smashed, no doubt, by the combat of radiations between the two adversaries.

Had Mazelier won? Suddenly, all the electric lights of the apartment, which had been switched on, flashed into activity, then died again, as though a sudden burst of current had caused a short-circuit. But the room filled swiftly with light and the helium lamp now looked no more than a candle, in the bright glare.

And filled with the joy of victory Gribal cried:

"We are saved! See how the day is coming back!"

He went to open the window, but recoiled, overwhelmed to see in the distance the red light of an enormous conflagration.

● The engineer closed the window quicker than he had opened it to shut out the vision. Overwhelmed, he murmured:

"Paris is burning."

Even Roger no longer cared to joke. Paulette, pale, looked into her father's face for some reason for condolence which she did not find there. Mme. Gibral was frankly frightened. To the north and east of them the whole city seemed ablaze, with enormous flames roaring up into the skies.

And thus this extraordinary business of night in the middle of day, of winter cold at the beginning of autumn, this boast of the unknown who swore he was going to destroy the earth, everything that had at first seemed a gigantic conjurer's trick was ending in a genuine drama of fire and ruin.

And what a drama! The world might indeed be saved, but Paris would be destroyed. Radiation of a force and character thus far unknown would not dissolve the planet, but Paris, at the heart of the disturbance, would be itself dissolved by the fire and nothing would remain of the most beautiful city in the world but a pile of ashes.

What had Mazelier and the unknown been doing? The scientist must be in danger, for his announcement of deliverance had been interrupted. He must certainly have tried to break the silence which the other had imposed upon him; he had not succeeded, and the city was afire. Gibral thought but a moment.

"I'm going back to the office," he announced.

"With the city all afire?" said his wife. "I beg you, don't leave us like this."

Worried and stirred by her plea, Gibral hesitated, then became firm. With a resolute reasonableness, he declared:

"Mazelier is in danger. My duty is with him at this moment."

The sacrifice was hard, but there could be no question of the necessity. Mme. Gibral, with damp eyes, showed that a Paris wife could show the qualities of a Joan of Arc.

"Go, then," she said. And she added, simply: "Come back as soon as possible, but not before you are sure you can leave."

As she spoke the doorbell rang. Roger ran to open, as though the unexpected visitor brought safety itself with him, and Gibral could not repress the feeling that it was no less that he brought when Roger returned to announce joyously:

"It's M. Mazelier!"

Gribal hurried to greet the scientist:

"I was just leaving to come to the office," he cried, "Why do you risk coming all the way here?"

"Risk? I haven't risked anything."

"What? With Paris all afire?"

"Paris afire? Where did you get that idea?"

Gribal opened the window again, pointing toward the Concorde, the Tuileries and the Seine:

"Look, look. It's frightful!"

Mazelier contemplated the flames that had alarmed the engineer and began to laugh:

"There's nothing burning. It's an illusion."

"An illusion?" repeated Gribal, stupefied, but delighted.

"Yes, and the proof is that I am going to take you into the middle of that furnace. I will guarantee that you will be no more exposed to the fire than you are at this moment."

And turning toward Mme. Gribal, he added:

"I believe I came into your parlor without wishing you good afternoon? Permit me to make my apologies, madame. And Paulette, how is everything with you? Hello, Roger, I see that you have borne up well under the dark wave and the cold wave we have just been having."

And the boy, at once respectful and familiar, replied like a true child of his age:

"Oh, me, M. Mazelier, you know how little things like that bother me."

And he added, expressing the feeling that they all felt;

"We knew there was nothing to worry about when we found out you were on the job."

"Ah, you think that—"

"That if something was going to happen, and it didn't happen, it was because you were there to keep it from happening. And that's all there is. It isn't difficult to understand."

Mazelier and Gribal exchanged glances, while Roger went on;

"After all, only a nut would think that the world would come to an end, just like that, while people hadn't had time to finish their lunch—"

"Do you know, Gribal?" said Mazelier, visibly amused by Roger's remarks, "do you know that everybody in Paris will be thinking like that tomorrow, and even more than that? Just as Roger has told us."

"Of course, it couldn't have been anything but some kind of a joke," insisted the boy, "the world didn't come to an end, did it, and there isn't any fire?"

● This simple explanation was a long way from being satisfactory to Paulette. The strangeness of the phenomenon had upset her elementary scientific knowledge; if there was really no more danger there still remained a good deal of inexplicable mystery.

Impatient to learn the explanation, she questioned:

"But really, Monsieur Mazelier, what had been happening? What's going on?"

The scientist was vague: "We'll talk more about it some other day, Paulette. For the moment the scientific problems involved are less interesting than some others. I need Gribal with me, and I must ask your permission to take him away. And if you wish to go out yourself, madame, don't let anything keep you. There is not the least danger. I repeat it, not the least. You will only have the impression of seeing fireworks all around you, but without any smoke."

"What, everything we see, it isn't—"

"Nothing at all. A coloration of the atmosphere, that's all. An enormous rainbow above us, in such a fashion that we don't see all the colors at once. They will penetrate the air one after another, beginning with the red. It will end with an indigo apparition, so that Paris will be successively enveloped in purple, topaz, emerald, sapphire and amethyst. And then the sun will come back and it will be all over."

"All over," said Gribal, with a little retrospective shudder.

"Yes, all over—for this time," added Mazelier in a voice which only his companion heard.

Neither Roger, Paulette, nor Mme. Gribal heard these last words. Only Gribal grasped their significance, and they brought him back with a start to reality, reminding him that M. Mazelier's tranquil air was assumed to impress the others. But why did he thus seem to encourage such incredulity and joking references as Roger's? And why, Gribal asked himself, this grave reserve behind, those mysterious words "for this time"?

In any case, there was one gain. The catastrophe announced by the radio had thinned out into a series of queer atmospheric effects. The affair had not ended badly—thanks to Mazelier, the silent victor in the unknown and terrible struggle. What a singular situation! An hour ago, seeing Mazelier go by, a little round-shouldered man with greying hair and a little beard cut to a point in the old-fashioned manner, no one in the world would have selected him as the savior of humanity. He would have been passed by with a glance and a remark—"That old chap? Looks like one of those goofy professors, with those thick glasses."

But behind those glasses, few would have observed that the eyes were young and modest, too modest to seek public applause for anything the brain behind them conceived.

But Gribal knew. He wished to cry out, to tell the world:

"Ah," he said, "what would have happened to all of us if—"

Mazelier interrupted him brusquely;

"Come along. We'll be late. You must hurry if you want to get back in time for dinner; we have a lot to do. And then Mme. Gribal would not pardon me, and what a fix you would have me in."

The scientist accompanied these words with a wink so unmistakable that Gribal understood at once that he was to say nothing. He shrugged his shoulder: "All right, I'm ready any time."

"Let's go, then. We have a rather delicate calculation to make at the office."

A calculation! Nothing would have pleased Gribal better under the circumstances. He knew without a word being said that the calculation had something to do with the mysterious promoter of the end of the world.

At the corner of the Rue Boissy d'Anglas and the Avenue Gabriel, with the immense panorama of the empty Place de la Concorde and the Seine spread before them, Mazelier suddenly gripped his assistant by the arm:

"Look," he said, "what do you see there?"

CHAPTER IV

The First Clue

● Gribal made no effort to restrain his cry of astonishment. To the flamboyant red along the skyline, which had so frightened him before, had succeeded an orange fog light and transparent, here and there thinning off into clear yellow as though the rays of the sun were trying to pierce it.

"It is exactly as you predicted," declared the engineer. "But I confess that I don't understand why."

Mazelier smiled a little quiet smile;

"And I am willing to bet that you imagine I understand everything that is beyond your depth? Alas! my ignorance is almost as complete as your own. For

what's the use of predicting something when the reason why it is taking place is unknown to you?"

And with the same expression of a half-smile which accentuated the expression of a good-natured old professor he habitually wore, he added: "Listen, Gribal, try to put yourself inside the head of the individual about whom we won't know anything till we've read tomorrow's newspapers."

"Tomorrow's papers. You're joking."

"Not a joke. We're reasoning in a vacuum—at least until we have news from all over the world. What has been happening in Paris is only a detail. We need the complete picture."

"But," objected Gribal, "the newspapers know as little as we do. In fact, they know less; nobody has any idea of what you've been doing. Instead of getting exact information by tomorrow we will be drowned in thousands of bughouse lies."

"Bah! We will try to read between the lines. But do you notice, my dear Gribal, that we are alone, absolutely alone, on the Champs-Elysees. Our countrymen have not dared to stick their noses out yet. They're going to laugh at each other soon. Here we are, at last. But who is that pulling up at the office?"

A powerful car, emerging from the cape of fog, which was already taking on a greenish hue, had halted, not indeed, before the main entrance to the office, but a few yards further along at the corner of the Rue de la Boetie. A tall man, with a soft felt hat pulled down over his nose and a scarf that concealed his chin, leaped swiftly from the vehicle, took several steps toward the office, and then, his eye falling on Mazelier and Gribal, turned, and leaped back into the auto.

"Wrong address," said Gribal, with a laugh, "you'll find the bar a little further down the street, old man."

The explanation apparently did not satisfy Mazelier. The engineer heard him grumbling:

"And why should that car drive up and then go off again as soon as we get here?"

"Pure coincidence. Anyhow, we have seen the first auto that has been moving in Paris since the end of the world. That's one rarity at least."

This mild pleasantry had no effect on Mazelier. Before entering he turned again to look after the car, which was moving rapidly away in the direction of the Rond-Point.

"And not a cop in sight to pinch him for speeding," said Gribal. "Whether this fog is green or not it is certainly a fog; that chauffeur ought to get his lights on."

"The chauffeur?" asked Mazelier, "By the way, did you get a good look at that chauffeur?"

"No, why should I look at him?"

"I'll bet anything he is a Chinese. A pure Manchu."

"The devil!" exclaimed Gribal, "we're in the fashionable world. A Chinese chauffeur, that's something clever."

"Anyway," replied Mazelier energetically, "his employer was not afraid of the fire, like you."

Gribal was impressed by the accent of the scientist. What did he have up his sleeve? He risked a sharp answer to draw his chief's ideas:

"If he wasn't afraid of the fire, what's more natural than that he should take a little ride around the town? We're doing the same thing, only on foot."

Mazelier shook his head:

"Listen, Gribal. Would we have gone out if we were not sure that we would find nothing wrong in the streets of Paris? But who informed that chap there that everything was all right? How did he know what we are the only ones to know?"

The engineer was silent, struck by the force of the observation. Mazelier went on, jerking along at a nervous stride in a manner that showed his preoccupation as he spoke:

"Therefore the man in the big car must be an accomplice of the bandit whom we are trying to discover. And what if it were he, himself? He, whom we have seen . . . "

The engineer had followed his chief into the inner laboratory as they talked, eager to assist at the calculation the latter had promised him; that remarkable calculation, which had so much and so extraordinary an importance. For he did not doubt that Mazelier would reveal to him the double secret of the attempt to destroy the world and the means by which he had overcome the destroyer.

"My friend," said the scientist, "we are about to work on a document of the first importance. Come over here; turn on that commutator. Good . . . Can you see clearly?"

"That map? But it is a map of Paris."

"Certainly. It's a map of Paris. Did you expect something else?"

"I admit it."

"And I understand why. Only, my dear Gribal, what worries me at this particular moment is not the nature of the phenomena we have been seeing. There are no theories to be deduced from them, nor any warnings for the future that we can draw from them. We can do all that sort of thing later—if we have time. Today, we must work at top speed."

"That is to say—"

"That is to say that we must first discover who it was who tried to destroy the earth, and at any cost, at any cost whatever—do you understand?—keep him from trying it again. For if we leave him alone he is sure to have another whirl at it, Gribal."

● And lowering his voice instinctively, Mazelier added:

"And he might be stronger than us the second time."

Gribal protested by shaking his head.

"No! A thousand times no, chief. Don't exaggerate the powers of that man. Don't underestimate your own abilities—you have just beaten him at every point."

"No doubt. I have beaten him, as you say. But how badly? We can only tell later. And while we are waiting, to work, my dear Gribal."

"But," protested the engineer, "the unknown must necessarily work alone. It is impossible to imagine that anyone would help him in such an enterprise. No matter how mad he is, he certainly would not have confided in anyone. While we—"

"While we? Well, well, Gribal; go on, finish your sentence."

"We have all the police forces of the world, all the civilized governments, everyone to whom we choose

to appeal. With so much help we could surmount any difficulty."

"You stupid, don't you understand? Don't you know what your contemporaries are like? Tell the world about the existence of the unknown, make it known that instead of a joke he really meant business, and all the imaginations in the world will go to work. An army of madmen, of criminals, of unknowns, will spring up, will be arrested on every hand. We should never find the real criminal. And depend upon it, our unknown has taken good precautions to prevent just such a public search."

"But, chief, what then?"

"Then we must get busy ourselves, my dear Gribal, with our own resources; we must search him out ourselves. A long and difficult task no doubt. Of course, the police could set up the same inquiries we could—less secretly, naturally. But they have two faults; this is a scientific problem and they know nothing of science, and they lack the necessary persistence. By tomorrow the police themselves will be issuing statements that there has been nothing serious going on. If I contradicted them, they would laugh—and all the other police forces in the world would laugh in chorus with them."

And rapping out his words, Mazelier went on with his tirade:

"It's up to us to undertake the job. And it is a dangerous job, don't kid yourself on that point. We will risk everything we have, our lives and the lives of everyone we touch. We can ask help from no one, we must beware of everyone in the world. If we go down, no one will regret us, and even if we succeed, I fear there will be no applause for us. Under such conditions, Gribal, are you prepared to go on with me? There is still time to say no."

For his only reply Gribal bent over the map of Paris that Mazelier had showed him.

"I am ready," he said, "what shall I do?"

"Simply this. Get yourself a compass, a ruler and a pencil. Good. Of course you know that just now my first care was to find out from precisely what point the cold and dark radiation was coming; or rather the interruption in the radiation of light and heat. Well, we will follow out on this map the course I have traced by means of my implements."

Mazelier drew from his pocket a sheaf of notes.

"Here, now. Find the place where we are now; Rue de la Boetie, at the corner of the Avenue. Now, trace along the line of the Rue Pierre Charron a line 900 meters long, on the scale of the map."

"Done."

"Where are we?"

"Place d'Iena."

"Place d'Iena. Remarkable! I imagined a little while ago that I had made a mistake in saying at first that the source of the trouble was between Passy and the Etoile. But I imagine now that we will not have to look elsewhere. Now Gribal, at the end of your line draw a perpendicular 300 meters long on the same scale. We are—?"

"At the corner of the Rue de Lubeck."

"Good. Rue de Lubeck. Ah, there's something wrong about here; I almost lost the trail. Something happened of which I'm not quite certain. But I tuned in on another circuit. At the extremity of the perpendicular of 300 meters, make another of about 1000 meters long. Wait, that's it! Hold it there, Gribal. Where's the spot?"

"Rue Cortambert, near the Place de la Muette."

The two men looked at each other, a little pale.

Mazelier was the first to speak. "We must go there, Gribal."

And almost thoughtfully, he added, "The Rue Cortambert! One of the quietest and most aristocratic streets in the quiet and aristocratic quarter of Passy."

"Yes," said Gribal, following his thought, "it seems impossible that the person we are looking for has not been noticed in a district of that kind. If only by the size and importance of his laboratory."

"True. True. At least, if . . . *Parbleu!* At least if he has not succeeded, like me, in simplifying his machine to an extraordinary degree. But why should he not have discovered the same things I have?"

Gribal had a thousand questions on the tip of his tongue, but he kept silent, knowing that his chief was not yet ready to answer them. For that matter, there would hardly have been time. As Mazelier rose, preparing to go, there was a knock at the door of the laboratory.

● Mazelier frowned. Who was daring to interrupt in spite of the strict orders he had given that he should not be disturbed? Gribal went to the door and found old man Bibent, the concierge of the office.

"What is it, Bibent? You know very well that M. Mazelier will not see anyone when he is busy in his laboratory."

"I beg your pardon, Monsieur Gribal. But it is a young electrician who says he'll tear the place apart if he doesn't see M. Mazelier. He insists he has something of the utmost urgence and importance to tell you. Here he comes, now. He looks honest, so I ventured—"

Gribal, in spite of his annoyance, could not repress a smile. Poor old man Bibent! He imagined himself a psychologist.

But the indiscreet visitor pushed old man Bibent aside, and with the desperate hurry of the very timid, addressed Gribal, speaking rapidly:

"Monsieur, I have a revelation to make concerning the events which have just been happening. Pardon me for interrupting you, but I must tell you about it. It's important."

Gribal regarded the unknown. The young workman really did look honest, and his air, at once modest and decided, spoke in his favor.

Bibent was eclipsed and vanished across the laboratory in the direction of the door whose watch-dog he was.

Gribal set himself to put a few preliminary questions:

"What is your name?"

"Monsieur, my name is Roland Duplay. I'm an electrician, and I have just finished my course at the Breguet school."

"And why did you come here instead of to the police?"

"Monsieur, because what happened this afternoon is so extraordinary that only a scientist like M. Mazelier can find the explanation for it."

"And you have something to tell him?"

"Yes, monsieur. I know who it was who declared he would destroy the world."

"Well, who was it?"

"It was the Marquis de Saint-Imier, who lives in the Rue Cortambert."

"Rue Cortambert!"

Instead of barring the door before the young workman Gribal seized him by the shoulders and literally pushed him into the laboratory.

"Quick, speak, my boy. Tell us everything you know. Did you hear, Mazelier? Rue Cortambert!"

Mazelier gazed calmly at the newcomer without the slightest surprise. He asked coolly: "How do you know?"

Duplay replied: "I was at the Place de l'Opera when the voice came through the loud speaker. I got as close as I could to it to make out better. And I swear to you that I recognized the voice. It was not two weeks ago that I was doing some work at the marquis' house. I was astonished at the things he had me install there. And his voice, monsieur! It's impossible to forget it when one has heard it a single time. That man frightened me, monsieur. It could only be him."

"But you should go tell that to the police, my boy."

"They wouldn't believe me, monsieur. The marquis is rich, he has a lot of pull, everybody knows him. They wouldn't even listen to me at the police. They'd tell me I was crazy. While you, you are a scientist, you can tell whether I'm right or not."

"And why should I know any better than the police?"

"Because you're a scientist. I have read your books, monsieur,—oh, if I could only understand them better. I have followed everything you have done."

Gribal and Mazelier exchanged a glance.

"Thank you, my boy," said the scientist. "And what can I do for you?"

"I don't dare ask for any reward," babbled Duplay. "I'm so ignorant."

Mazelier divined the thoughts that were agitating the young electrician.

"Well, Monsieur Duplay," he said, accenting the word "Monsieur," "I advise you to stick to your profession, but if you have any leisure time you may employ it at this office if you wish. Gribal will show you the researches we are carrying on, if you think you would like to see them."

Overwhelmed with emotion and gratitude, the workman stood before them, incapable of pronouncing a single word. But his attitude and his glance showed that the two scientists had gained the undying devotion of the young man.

"Now," said the scientist, "one last question. Here's a map of Paris. Would you mind showing us the exact point where the marquis' house, where you made the installation, stands?"

Duplay bent over the map. Then with a visible astonishment:

"It's exactly at the point that is marked with a blue cross"

And he looked up with wondering eyes:

"Did you know, then?"

"Faith!" said Mazelier, "we know what hole he was in, but we didn't know the name of the rat. Good, Monsieur Duplay, you may come back here whenever you like. I have the conviction that you will be a scientist some day."

The electrician bade them farewell, his face alight.

"Do you think he's all right?" asked Gribal.

"Entirely! And now, let's go have a look at the Rue Cortambert. It will be a nice little walk, and I am curious."

Gribal glanced out into the Avenue.

"The sun has come back," he announced. "Look, look! What a crowd. What animation!"

"Yes, of course. Everyone knows it was only some kind of a joke or nightmare now. They're all telling each other how brave they were."

CHAPTER V

New Development

● He was not far wrong; it was the end of the nightmare. One would have said that every inhabitant of the great city had come out to salute the return of the light of day in a public and universal joy like that of some grand holiday. For a few moments the people of Paris seemed strangely purified; their delight, their happiness bade farewell to all hatred, envy and despair as a breeze drives away a pestilential mist.

From the Etoile to the Concorde a human tide flowed without ebb. Mazelier and Gribal even had some difficulty in making their way through the crowded streets.

"Ah," said the engineer, "this makes the sun-worship of the barbarous ages comprehensible."

"Yes," said Mazelier, "but just at the present moment I would be more appreciative of the benefits of civilization in the form of a bus."

"But look how everybody is moving around," cried Gribal. "Decidedly the Parisians are easy to reassure. Here, let's get up to the Boulevard Haussmann and take the electric."

The electric monorail car, quick, light and silent, which ran from the carrefour Drouot to the Muette, was right on their route. Fifteen minutes later the two amateur detectives descended at the Avenue Henri-Martin, near the Rue Cortambert.

Mazelier explained:

"There are enough people in the streets so that we won't be noticed. We'll go along slowly as though we were out for a stroll. Unless I'm much mistaken, we will know very quickly when we come to an interesting place."

"And how will we know?"

"Oh, a little trick of my own, Gribal. Look, this will give us the signal."

Mazelier drew from his pocket a little round object.

"What's that? A watch? And how will that signal us?" asked the engineer, surprised.

"It's rather like a watch, true. But it isn't one all the same. There's a little buzzer inside—oh, a very little one—that will sound when we get close to the emission source of any unusual wave radiations. If, as I expect, our adversary is still at work, it will reveal his presence, and we will know both where he lives and where he carries on his labors. Look, I'm going to wind it up; that will set it to catch any radiation."

Mazelier had put on a different pair of spectacles and held in his hand a sporting journal in which he seemed to be deeply interested as he strolled along. For the

passers-by, he was the perfect model of a little shopkeeper intensely interested in the outcome of the bicycle races, but whose personal devotion to athletics does not extend beyond a two-block walk after dinner.

As to Gribal, he lighted a cigar and assumed the air of a boulevardier whose ambition is limited to eating two well-chosen meals a day and making the circuit of the most famous cafes of Paris for a drink in each afterward. Both of them paid no attention to each other. These precautions were hardly exaggerated, considering the fact that they knew nothing either of the ability of their adversary or his means of defense. His means of defense?—rather his means of attack.

Thus they arrived at what Gribal called the "hot spot." Mazelier slackened his pace, and then halted, holding his watch to his ear like a man who doubts whether it is in running order. And his face showed a lively surprise, followed by some irritation.

He went on to the end of the street, followed at a little distance by Gribal, who understood that the apparatus invented by his chief was not giving the hoped-for result. Had Mazelier made a mistake in the house? No, for he had turned back and resumed his patrol before the same building.

All at once the bugle of a large auto sounded a blare of notes, and people crossing the street leaped out of the way of a huge car which arrived at high speed, pulled up suddenly and swung through a double gate that opened to receive it. The auto was swallowed up in the inner court of the mansion; a building decorated in the most sumptuous style, but too modern in character to catch the eye of an artist.

On the sidewalk, near Mazelier and Gribal, two passers-by halted to watch the entrance of the big car.

"Who's that?" asked one of them.

"Don't you know?" asked the other in the superior tone a butler in a grand household would employ in informing a new porter of his duties. "That's the Marquis de Saint-Imier. There's a chap who doesn't worry about a thing—even the end of the world don't keep him from running around the town."

Gribal felt someone nudge his elbow. Mazelier motioned him to follow to a little distance.

"Did you see?"

"*Parbleu!*" said the engineer, "the chauffeur was a Chinese."

"Did you recognize the car?"

"I recognized the chauffeur even more vividly."

"Wait a minute."

Suddenly Gribal jumped. The sound of a little buzzer came sharply to his ear, causing him more fright than the voice of terror on the loudspeaker.

● "All right, daughter?"

"I should say so, father. And you, mother? We ought to amuse ourselves a little from time to time; we have had so much to worry about. Are you coming with us?"

Mme. Gribal was slightly scandalized:

"Me? To go to a reception at the ministry? You're crazy, child. I'd be bored to death. And who would get your lunch for you?"

"Ah, that wouldn't matter. For once in our lives we could do with some chocolate and cakes."

"Yes, yes. It's easy to say that beforehand, but when the moment came I think you'd want something a little more substantial. No, no, run along with your father to the reception. I'll stay home and take care of Roger."

"Thanks very much, but I don't need it," said the young man of whom she spoke.

But Gribal came to the rescue of the maternal authority:

"You stay home, young man. You'll see too much of receptions and ministries when you grow up. But you can go to the movies tomorrow, and let Paulette get lunch for you."

Paulette was genuinely enchanted with the invitation to the reception, which had arrived no later than that morning. Even a girl whose heart is set on becoming a scientist sometimes enjoys putting on her best dress and going to parties. She found the Minister of Science a delightful person and was quite prepared to vote him into office for life. She was even so happy over the prospect that she forgot the mysteries of the day before and the scientific questions they aroused and which she was so anxious to resolve with her father. Paulette was not ignorant of the fact that the Minister of Science was at once a politician of some prominence and well known in the fashionable world. His invitations were as much in demand among the smart set as among the universities.

But Paulette could not but wonder why the Minister of Science should organize one of his most recherche receptions on the very day after the extraordinary event which had alarmed all Europe for a space of several hours.

Gribal thought he understood, but said nothing. He had talked the matter over with Mazelier, also one of those on the invitation list. But the scientist had told him:

"I don't think I'll go. I will hear so many stupid remarks that I would end up by laughing in their faces, and being in an official position I haven't the right to laugh. You go, Gribal. Look around you, listen to everything they say. If you find out anything interesting, you can give me the news at the office tomorrow."

"Don't you think it a little—premature, this idea of the Minister's, of having a kind of fête so soon after the attack of the unknown?"

"My dear Gribal, I think the minister is perfectly right. I'm going to tell you the truth—in official quarters they are absolutely terrified. They don't understand in the least what has happened. Only they want to reassure the public and what better means than a big society reception as though it were all nothing, what has passed? It will be a fête in honor of Science—do you get the idea? In the honor of Science, which defends, protects, and sometimes ultimately explains the inexplicable. The Minister is pretending a tranquility which he is really very far from feeling."

"Did you see him?"

Mazelier smiled slightly:

"Now do you really doubt it? The Minister summoned a whole army of meteorologists in the greatest urgency yesterday evening. There was a great deal of discussion about currents in the upper atmosphere, the Heaviside Layer, the effect of charges of electricity on abnormal atmospheric depressions. And as nobody

understood what anybody else was saying, they wound up by cooking up a story to issue to the public. When you get to the heart of it it is quite meaningless. Oh, a good story, you understand . . . Something about a wireless amateur who got the atmospheric electrical currents all tangled up, and who has now been arrested."

"But," cried Gribal, "such a yarn can't be believed for a moment. And the cold? And the sudden darkness? And the impossibility to make any light? And —"

"Yes, yes," said Mazelier, "all of that. But you forget that the crowd forgets quickly and thinks not at all."

"Good. Suppose we admit that But even the crowd reads the newspapers. And the newspapers this morning had the news that the cold wave spread over all the eastern district of France and most of the rest of Europe, beginning with the meridian of Paris. We know that the wave of darkness did the same and only ended at the line that passes through Riga and the tip of Greece. We know that west of Paris nobody noticed any effect except that all the wireless sets went out of order. But how in the world can anybody take the combination of all these phenomena for a mere joke? Who would believe it?"

"Who? Everybody. The public has become used to the marvelous. When there is some new miracle every day, you get bored with the next one very quickly, and end up by not paying attention to any of them?"

"Don't you wish to see the Minister and tell him what you know?"

"Once more, no! And after all, what do I know? Reflect, Gribal. What do we really know? Just what the papers have printed, no more. Three quarters of Paris felt the effects of the cold and dark waves. Auteuil and the Bois de Boulogne were only relatively dark. Further west the sun went right on shining. And then?"

"Then," said Gribal, "I deduce that someone in the Rue Cortambert succeeded in—"

"Oh, yes. The Marquis de Saint-Imier. The moment has certainly not come to reveal what we have discovered or even to be sure of the guilt of a man we have never seen. Go to the reception, Gribal, amuse yourself. I doubt whether you will find the key to the mystery at the Ministry of Science however."

"And you, chief, what will you be doing?"

"Me? I'll work. At least up to midnight. See you tomorrow, but be careful who you talk to about it."

● The engineer, although obedient to Mazelier's advice could not resist the impression that he was overcautious. Why should he, Gribal, in an assembly which would include the most eminent and respected scientists of the country, be careful about whom he talked to? There would be women there, naturally, but none of the women one would find at a ministerial reception would be at all likely to even understand a scientific theory. He determined to establish himself in some quiet corner and watch what went on, obeying Mazelier's command to the extent of not talking about anything with anybody.

Paulette, naturally, was in an entirely different state of mind. Her pleasure had no alloy. Arriving at the ministry, she was at first a little frightened by all the splendors, to which she was a such a stranger, but a Parisienne of Paris itself, her embarrassment was only momentary.

Besides chance brought her under the eye of one of her school professors in the very first moment, and before she had time to think about it had been presented to ten different people and drawn into the midst of a particularly interesting conversation.

"I assure you," Mme. Reynier-Vitral was saying, "that my husband doesn't see anything at all extraordinary in what happened yesterday."

"Really!" exclaimed a woman who had a doctor's degree and lost no opportunity of letting people know it, "What sort of thing must happen to astonish a chemist?"

"But the affair yesterday was nothing but a kind of chemical experiment that could be reproduced any time one wished."

There was a unanimous chorus of protest. A woman lawyer's voice rose above the rest:

"Oh, do tell your husband not to repeat the experiment right away, please! What jolly jokes these chemists make—to turn our temperature into 40 degrees below zero on a moment's notice."

"Without mentioning that it was so dark you could cut it with a knife," added Mme. Brasseur, "To be cold, that's all right, we can understand it, but not to be able to see people's teeth chatter—it's absolutely ill-bred."

M. Moutonneau intervened:

"But, dear lady," he said to the lawyeress, "Who told you that it was 40 below? I'm certain that it was a lot nearer eighty."

"Impossible!" said the learned dame, impolitely.

"But, asking your pardon a thousand times, it is not only possible, it happened."

"Oh, monsieur, I will pardon you ten thousand times, but not for your eighty degrees below zero. But look —we wouldn't be here talking if it had been that cold, we would all be dead."

"It's a singular fact," remarked M. Perignon, "that there has been no epidemic as the result of the cold wave —not even a single case of bronchitis."

"Which proves that the human body can support extremely reduced temperatures."

"Impossible!" declared the doctress again. "I know from my personal experience how easy it is to catch a cold."

Paulette ventured timidly to toss a question onto this sea of conversation:

"But what was the cause of the dark and the cold?"

"Well," said Mme. Reynier-Vitral, "according to my husband it was this way—it was a question simply of the absorption of light by the agitated electrons of matter. The American physicist Millikan, in 1927, predicted the possibility of such phenomena."

But nothing in this ordinary banal drawing-room conversation predicted what was to follow a few minutes later.

Nevertheless, Paulette had a vague presentiment of something about to happen, for which she could not account.

She insisted: "Good. That answers for the dark. But the cold?"

"Couldn't that be explained by an almost total ab-

sorption of the light in the upper atmosphere, thus producing a drop in the temperature?"

But Paulette, now less bashful, plunged on with the question she had already put to her father: "But, Madame, how do you explain how we managed to breathe while all combustion had become impossible?"

Everybody looked toward the wife of the chemist. As a matter of fact all had remarked it; nobody had been able to relight the lights that had gone out. Therefore, there was no oxygen for combustion. Then how was it that every being plunged into that sinister and sudden night had had the impression of breathing more deeply and freely instead of succumbing at once to a lack of oxygen?

Mme. Reynier-Vitral, fortified with the science of her husband, did not hesitate a second: "My husband," she said with becoming modesty, "thinks that radioactive gases were somehow set free in the atmosphere yesterday. Everywhere in the laboratories they were following the experiments of MM. Bayeux and Vaugeois. Therefore the composition of the air was modified, but without being changed in a fashion dangerous to living beings. The proof is that we could live in the modified atmosphere."

CHAPTER VI

The Secret Exposed

● This explanation, which really explained nothing at all, enthused Paulette. She believes she saw the first rays of the light of truth. And why should it not be possible, in the secrecy of the laboratory to create, and then to spread abroad, unknown gases, rays up to now unfamiliar, since their number and power of expansion was theoretically infinite?

Nevertheless, M. Perignon was not at all satisfied. He spoke slowly:

"I would like to know what M. Gribal thinks about all this."

And addressing himself to Paulette, he added: "Your father must have made some observations on the affair?"

The young girl was about to reply when she was interrupted by an occurrence. Professor Perignon's question had been heard by a personage whose elegance, at once athletic and aristocratic, was remarkable even in that assemblage. His face was expressive and his eyes almost incredibly active. There was a sort of concentrated irony in his smile as he approached Senator Moutonneau, and asked:

"Gribal? Who is that Gribal? I don't remember having heard that name before."

The senator replied, loudly enough to be heard by the whole group: "That name, my dear marquis, belongs to a man of the first rank. Gribal is the principal collaborator of the famous Mazelier."

"Mazelier! Faith, I didn't know that he was so famous. In any case, that young lady is certainly a beauty—hardly what one would expect of the daughter of a scientist."

And the man who has been addressed as a marquis, went on, with a little laugh: "Tell me, senator, if someone succeeded in disassociating matter, wouldn't it be a shame to dissolve such a beautiful assembly of atoms as Mlle. Gribal?"

Had this rather impertinent speech been made deliberately in a tone of voice a little loud? In any case, the reflection was distinctly audible to Paulette's ears. The young girl blushed, then turned her back to hide her chagrin at the remark, by which she was not at all flattered.

But the marquis, as though he had not remarked her annoyance, advanced toward the group with the ease of a man of the world whom nothing upsets. He saluted Mme. Muserolle and extended his hand to Professor Perignon. Then, excusing himself for having interrupted the conversation, he bowed before Paulette with a courtesy that was more than a trifle exaggerated.

"I believe I overheard them addressing some very interesting questions to you?" he said in a tone of inquiry.

"Yes," said the senator, "they were asking her what M. Gribal had thought of the events of yesterday."

All eyes turned toward Paulette, and she felt as though she had never in her life so much desired to give a sharp answer to anyone.

"How can you find the observations of a man you never heard of interesting?"

But instead of saying the words that leaped to her lips, she lifted her eyes to those before her and saw them so attentive, so respectful, so little like what the remark had led her to expect that she felt ashamed for her thoughts. After all, he was also one of the Minister's guests. She replied, a little confused: "I don't think my father made any special observations. In fact, I am sure he didn't."

And she went on, rather naively: "If he did make any, he hasn't communicated them to me."

Was it possible that what she had just said seemed to afford a certain pleasure to the marquis? But M. Moutonneau lifted his head:

"It is impossible that a man of Gribal's intelligence should not have made some extremely interesting notes in a case like this."

"Really?" inquired the marquis in a tone that contained a good deal of sarcasm.

But Paulette did not perceive the undertone.

"Certainly!" declared the senator positively. "Gribal would not know whether it was forty degrees below zero or eighty, but he has, I am willing to wager, some extremely interesting opinions on the dissociation of the atom and the destruction of matter."

"Brrr!" said the lady doctor. "Let's talk about something else."

"Let's not," said the marquis. "Tell me some more about it, I beg you. I am as ignorant as a herring, and would like to obtain a little information while I'm in such scientific company. You think it's possible to destroy matter completely?"

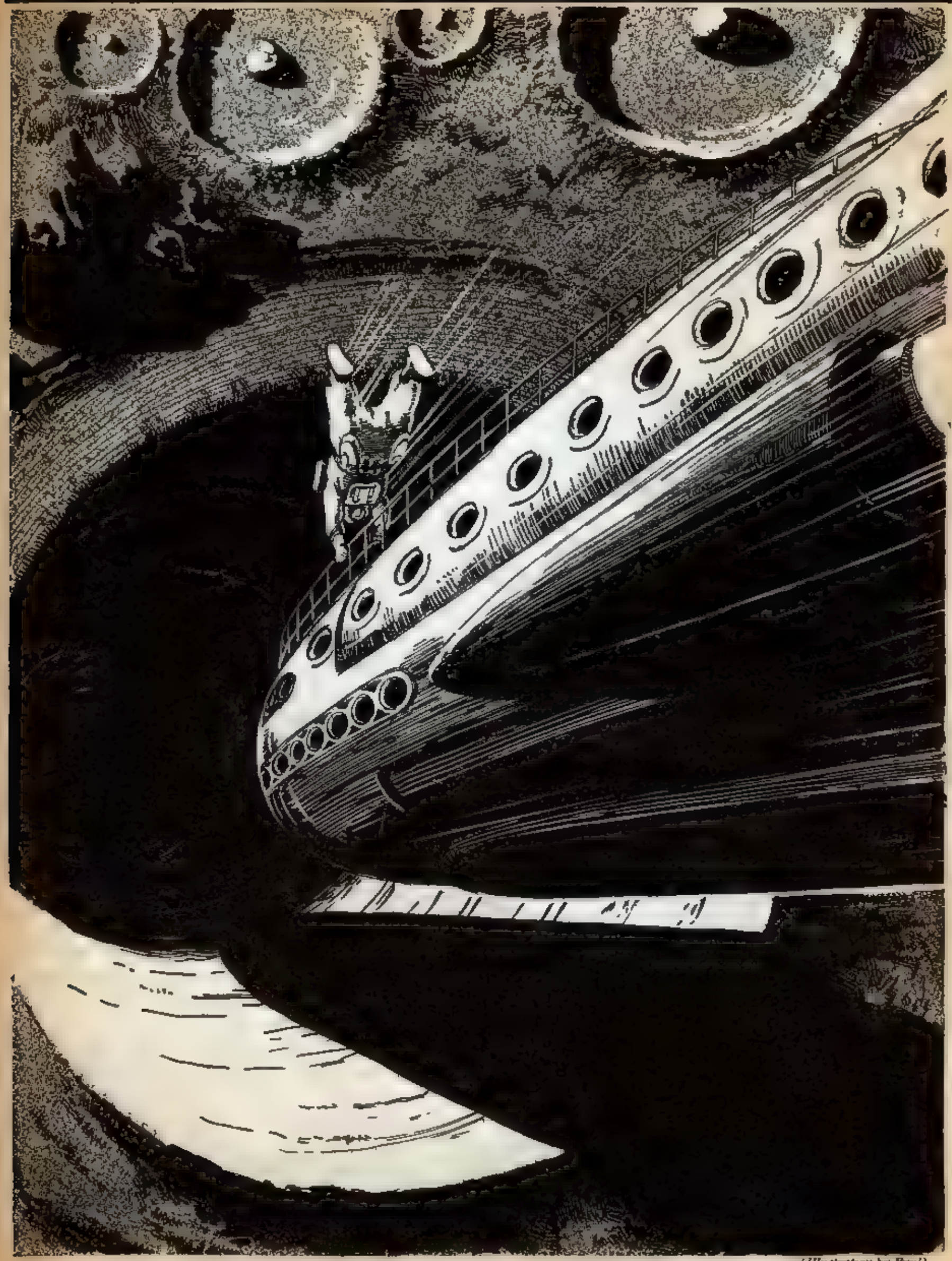
"Oh," cried Paulette, carried along into the discussion in spite of herself, and excited by having her father's name dragged into the conversation, "Oh, it's just impossible."

The marquis cast her a furious glance, but it was in a suave voice and with the most charming smile that he replied:

"Ah, really, mademoiselle! I am glad to hear that M. Gribal thinks so."

"My father has always told me that to dissociate matter is not to annihilate it."

(Continued on page 88)



(Illustration by Paul)

The shaft opened up black and wide. The ship crowded on. Lofty peaks and pinnacles were reaching up. The ship's nose touched him. He gripped the rail and hung on.

CAPTIVE OF THE CRATER

By D. D. SHARP

● This story, simple as it may be in plot, is as unusual as any we have had the pleasure to read. The idea of a human pendulum, swinging two thousand miles, perhaps eternally, in its path, is one to challenge the imagination.

Mr. Sharp has pictured one of the surprising and unexpected experiences that might befall an interplanetary explorer, trying to make his way under conditions vitally different from those on earth. And he has written this story with such breathtaking suspense, that little chills of horror and anxiety are bound to course through the reader as he follows the lonely adventures of our explorer.

● The spectacular space flights of Colonel Hugh Lewis have made him the idol of hero-worshipers the world over. Lunar archaeology, geology and biology owe much to his painstaking investigations during the several trips he made to the moon.

Probably his most revolutionary discovery should have been guessed centuries ago. Every one knows that it is impossible for any one on earth to see the far side of the moon. At one time the moon doubtless rotated fast enough to show both sides to earth, but tidal influence has dragged at its rotation until it now turns in exact time with its revolution around the earth, and in consequence the same face is always turned earthward.

Still, no one ever thought of offering any theory as to why the particular hemisphere one now sees, hangs toward earth, rather than the opposite one, until Lewis gave astronomers the picture of a heavy-sided moon. Of course the heavy side would hang toward the earth. But the moon is not distorted, it is a sphere with a concave, or sweeping depression of vast extent, on its far side. This was once a great lunar sea.

But this is not a treatise on lunar geography, nor a biography of Colonel Lewis, though one must know something of the man to properly appreciate the situation which came about.

Lewis and his party had landed on the moon near the sunset area to escape the extreme temperatures of both day and night. Some distance from his space ship, the *Moon Bird*, was a ragged little crater which has since been called the "Crater of the Moon." It is small only in proportion to the much larger and better known craters of the satellite. Tycho, for instance, is nearly sixty miles across, while the "Crater of the Moon" is only about a mile from rim to rim and less than half a mile at the mouth of the funnel. It is exceptional only in depth. No other hole on the moon nearly equals it.

The slope to the funnel is extremely sharp. The lava is smooth and glass-like. Even the ash and pumice, which are abundant over most slopes of Luna, are missing. Further, there is none of the litter of meteorites which pock the whole surface of the moon. The slope is too slick and steep to retain it.

Beside the little volcano the expedition discovered the deserted city of Bez, uncorroded and undecayed after countless ages of assault from meteors which struck the surface. That evidence of a former civilization on the dead sphere intrigued Lewis into attempting a descent into the crater. He hoped to find something which might reveal the type of lunar inhabitant who must have been annihilated by the gradual loss of atmosphere from the satellite.

Accompanied by Pike and six of the crew, roped together, they crept up over the rim and entered the bowl. There the rock slope seemed to crawl beneath their airsuit boots. The steel of their pikes could not scratch the hard glaze of the lava and the greatest caution became imperative.

Vision was incomparable for there was no atmosphere to haze the landscape, objects miles away were sharp and clean where the sunlight touched them. In all the lunar expanse, there was no cloud, no speck of floating dust, no ripple of breeze, nothing to disturb the infinite serenity of the dead satellite. The setting sun was white, not red. The shadows were black, not grey. There was no twilight. Night and day were absolute monarchs of the surface they attained and shadow belonged to the kingdom of night.

Far down in the bowl a great shadow from the western cone fell across the mouth of the crater, and that lack of air, which made vision so perfect, made the shade impenetrable night. That portion of the crater simply did not exist so far as the eye could see, though sunlight caught the far rim of the funnel. Some distance down, the glazed slope became so steep footing was hazardous. One of the men slipped and was unable to balance himself with his staff. The men behind tightened on the rope, but with their own unsteady footing the man toppled against Pike.

Pike was a big fellow as surefooted as a llano. Yet he barely stopped the slide as Lewis swung back to assist him.

For a moment the company hesitated. In their bulbous airsuits and steel helmets, they looked more like anthropoid beasts than men. Easily, they might have been mistaken for weird lunar hobgoblins venturing toward the bowels of the moon.

● Lewis glanced down at the empty gulf which fell away from his uncertain feet. He regarded the black shadow upon the crater mouth. It suggested the oncom-

ing terror of lunar night. Something of the weird majesty of that dead world, of its changelessness; of the infinite endurance of the slightest contour of its cast; of the defiance it offered to all forms of life; its sullen, temporary tolerance of his invasion, assailed his unyielding, stubborn courage.

Another accident might not end so happily. Once the whole of the party was started it would volley down the slope. He knew what each man with him was fighting down. The alien, isolated feel of this venture against the inflexible infinite. It was not the fear of death. That was but a tame thing, something all men must meet with what fortitude they might. It was life venturing the forbidden, defying the barriers of the omnipotent. It was the feel of sacrilege, the weight of their utter insignificance.

He raised a hand for a momentary halt. The seven men behind him stood unsteadily. It was evident they expected a command to turn back. Instead, Lewis unsnapped the coil of rope which connected him with Pike and nested it at his belt. Then he wig-wagged in the expedition code:

"Wait. I will test slope. Can't risk loss of all.
If I fail and rescue unfeasible Pike will take charge.
Gather collection from Bes and return to earth."

Pike and the crew were plainly hesitant though obedience was one of the tenets of their valor. It did seem suicide to venture down alone without ropes and men, but Lewis was determined to explore the crater. He saluted stiffly, wig-wagged the men back to safer footing and moved cautiously down.

The slope became steeper. Almost constantly it was a battle of pike and feet. First one and then the other skidded. Then there was a longer slip of a foot, a deft counter with the staff, a backward fling of his body for balance, both feet out from under him, and he was down on the glaze sliding hard.

He threw himself flat and dropped his staff. Arms and legs spread wide he clawed for life with hands and heels. The pole went skiing down the glaze, swift as an arrow. Spread-eagled, his body was soft and had more tenacity. For a moment he thought he had won, and then he felt the slope crawling under him again. Slowly at first, and then faster, he slid down the glaze. Moving very fast he reached the abrupt rim and vaulted, feet first, down into the pit, to drop into vacant night.

For a moment he was blind as a bat, then he raised his head to look upward. It was as though he stared from a dark cave. The stars, the sun, the black glistening slope, the midget men crouching far up, were plainly seen even as he fell. But he could not see his hand before his face unless it was between him and the light.

He dropped inert, numb with the certainty of what was soon to follow. There was no rush of air as there would have been on earth. The only warning that he was dropping was the uprushing slope and the quick dwarfing of the midget men clinging to it.

For a moment there was a dead resignation. Every muscle had become taut as he cringed from the impact at the bottom of the shaft. Down he dropped, nothing to halt him, nothing he could do to help himself. He had the sensation of being entirely weightless, suspended in gloom. He lost sense of direction as he lost sense of weight. Up and down had no relative value without the rush of air against his body. He got the impression that he was floating through an unending tunnel as the light above him drew to a white star which became tiny and far away, fading into a vast void of sooty gloom.

Queer ideas ran through his mind. He imagined impossible rescues. Feathered birds of great size rushing from the pit to bear him out on their broad backs. In saner moods he would have known no feathered bird could fly on an airless moon.

By sheer force of will he unclenched his hands. He puzzled at the incalculable depth of the hole. The moon was pocked with craters so mammoth as to dwarf any of earth. He guessed the caverns inside must be as huge in proportion, for the moon's mass was small and rock and dirt on its surface were very light of weight and there was no wash of rain and erosion to fill the great cavities from the volcanic gases. But he had never imagined a hole so deep a man might drop minute on minute before reaching its bottom.

He shook off the stupor of his first plunge to death. He might as well live out the minutes left to him in the same pursuit at which he had spent his years. He reached into his airsuit pocket and got out his flash, cut on its switch and played the focus on the nearest wall. Due to the lack of light reflection he could get no comprehensive glimpse of the rock which flowed upward in an endless ribbon of gray.

Into the Moon!

● He played the light into the abyss below him but saw nothing beyond empty gloom. There followed an unending timeless period of darkness. He switched the light upon the wall again. The ribbon of gray flowed like water under pressure. The velocity of it bewildered his eyes.

The focus of the light caught his wrist watch under its transparent shield. A quarter of an hour had passed since he parted from the men. That meant at least ten minutes falling straight down. His velocity now would be one-half gravity time square.* He could scarce believe it. Even on the moon a hole that deep would stagger the imagination.

He closed the switch of his flash. A sooty void entombed him. Blindly he waited the end.

As the crash delayed he began to wonder if he was not the victim of a very realistic dream. He tried to wake himself up. He played the flash into his eyes. Its light was real enough. He kicked his feet together and squirmed in his airsuit. He shouted in his ears. The air inside his suit made that possible.

An hour, tense and puzzling, took the minute hand of his watch around the dial but brought no change to the weightless void.

With some of his old assured poise he began to weigh the facts as he knew them. Certainly he had fallen into an astounding crater. Could it be that the inside of the moon was hollow? He smiled grimly at his desire to clutch such a bizarre hope. Even if the moon was a hollow globe, even if he could, somehow, survive the impact with its far side, he would finally come to rest suspended in vacuum at the very center of the globe!

His light revealed that he was drawing quite close to the wall. At his downward velocity the slightest contact would rip his airsuit and mean instant death. He wanted to live as long as possible. He wiggled and

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* S (distance) = ½ at². Of course a (acceleration) changes as the distance from the surface is changed.

struggled without effect. Without air resistance to his struggles he hung helpless. The gravity of the wall for his body slowly drew him in. He could almost touch it where it volleyed upward without sound nor stir of breeze. It seemed uncanny such a thing could be.

With every flash of his light it pressed nearer. He stared until his eyes grew dizzy. He cut the switch to avoid the torture of watching the measured approach. He no longer struggled. The wall came too close. In the dark he clamped his hands to his thighs, stretched his legs stiff and straight. He waited, nothing under him, silence all about. He knew the upward flow must be almost touching him, yet it gave not the slightest evidence of its menace in that soundless Stygean night. He had an overpowering desire to look again, to find how near the doom had drawn.

The gray geyser spouted not six inches from the goggles of his air suit, as he switched on the light. Immutable gravitation would drag him against the flying rock unless he did something! But what could he do?

He could poke the cliff with his flashlight and probably push himself some distance away by the time the flash was wrenched from his grasp. But he did not want to give up his light. To risk it would prolong his life only a little while and he would lose the only friendly thing in all that gloom.

As he debated he was drawn nearer to the wall, so slowly it was difficult to detect his approach, and yet certainly the passing minutes were bringing the end. He must do something to push himself back from the rock.

He thought over the articles of his equipment. There was his gun. It would push him away once. And yet, dropping into he knew not what, he had an instinctive feeling he should not abandon his only means of defense. He could slap at the wall with his coil of rope, but there was as much chance he would be caught against the wall as driven away. His canteen would be hard to get loose.

Then his gun raised a new hope. He could raise it far over his head, thrust its muzzle quite near the wall and fire. The bullet would ricochet upward and the recoil from the explosion would push him away.

He lost no time in trying out the plan. Very carefully he got the gun from its holster. A careless move might thrust some part of his body against the wall. He raised the gun far above his head and fired, not once but twice.

A little later he regretted his overzealousness. One shot would have been ample. Two of them hurried the flowing wall far back into the gloom. Soon his flash could not discover it at all and the far side came drifting into view. Like the other wall, it seemed entirely too regular to be the mere result of chance. An ancient civilization must have accomplished a Titanic feat in smoothing out the crater. Was it possible it had been fitted as an exit for a subterranean people? Had the men of the moon taken refuge inside the globe as the slowing rotation of the moon gave a wider and wider spread between day and night temperature? That smooth wall certainly suggested something of the kind. He approached the opposite wall so fast he had to use another shot to keep away from it. When his light could discover neither wall, he cut it off. For a long time he was in total darkness, and when hours of dropping brought no crash he began to hope. He figured roughly that it would take him about four hours to reach the center of the moon. That time must have nearly passed. Soon acceleration would halt and his velocity gradually decrease.

● He discovered he was thirsty. He attempted to lift his canteen to the plug in his airsuit. He worked his lips around the intake nipple and tried to fit the canteen into the socket, but something held the strap. He switched on the light to see what was wrong and was startled by the scurrying wall close before his eyes. He had thought himself some distance away. Danger was imminent, a sudden change in the rock would instantly finish him. Instinctively he dropped his flash and reached for his gun, raised it above his head and fired. Then he grabbed for the fallen light. His fingers could not reach it where it fell at the speed of his body. The recoil from his gun had floated him away.

He could not wait for the wall to draw him in again for it would also draw in the flash, to splinter it. The short coil of rope still hung at his belt. He loosened a few loops and made a cast at the flash. The rope ran out to its length and spread a noose above the light but seemingly it would not fall. It appeared to rest on nothingness, just as did the flash and Lewis himself.

He retrieved the noose and by giving it a downward fling, succeeded in whipping it against the light, which came floating past and he was not slow to grab it.

After that experience with the wall, Lewis watched with more caution. Twice more he discharged his gun to push himself away as the hours dragged. By that time he was certain the shaft was unique. He must have passed the center of the moon and if there was an end of the shaft it was up instead of down. That being the case surely some fall of debris must have occurred in all the ages that had passed. And yet he had encountered no system of suspended rock and shale as he passed through the center of gravity.

Still, what hope was there, after all? A human pendulum inside the moon! Very likely he would get no opportunity to find a footing or hand hold at the end of the shaft.

A white star of light bloomed far down, or rather up, beyond his feet. It grew far more rapidly than he had expected. Every muscle tense, every sense at attention, he waited. If there was a chance for a hand hold at the mouth of the shaft he was ready.

As the mouth widened he became puzzled and then amazed. His velocity should be slowing for a halt, instead, with breath-taking speed he shot from the pit! Feet skyward he rose straight toward the daylight stars.

The barren pinnacles and craters fell below, folded together and shrank away. The black pit which had vomited him up, closed its cavernous mouth and was lost in the shrinking landscape. And still he rose, bewildered and giddy at the altitude he attained. Up and up with no suggestion of an end to the ascent.

That was the first glimpse Lewis or any earthman had of the concave side of the moon and if took some time and logic for him to understand why natural law sent him rocketing above the mouth of the pit. He did not know then that the concave hemisphere put the opening of the shaft some fifty miles nearer the center of gravitation than the crater into which he had fallen on the opposite side.

When it seemed he would float up to form a satellite of the moon itself, he fell back, head first, down toward

the towers and turrets, the pinnacles and craters and the grey sea of pumice and ash. Legs pressed tightly together, hands and arms clamped to his side, he was a human arrow returning, hoping he would not miss that hole. He felt none too reassured for he could catch no glimpse of it, though it was half a mile across.

The mountains unfolded as rapidly as they had closed. The pit opened again and swallowed him into its sooty void, but he was better prepared for what lay ahead. Still he had little hope. He knew there was barely a chance of escape at the far end. He doubted if he would come within fifty feet of the mouth of the shaft, for he had hindered his momentum somewhat by the explosions from his gun.

Of course Pike and the crew would make every possible attempt at rescue, but what could they do? It was a perilous task to even reach the mouth of the shaft. Sixteen hours must elapse before he reached the earth side again and very likely by that time he would be given up as dead. He remembered he had ordered Pike to take off for earth in that event.

There was a wriggle in his flesh at the thought of being abandoned on the dead world. How long could he endure the soundless terror and hold on to his reason? How long would he swing back and forth inside the moon before his helpless body found its rest?

The Human Pendulum

● He had a lot of time to think as he dropped, but in no way could he devise escape. He was barren of a plan when he finally saw a star of light in the void ahead as when he re-entered the world of gloom. The star grew in size slowly as it should with his slowing for a drop. He watched it and blinked his eyes with a new puzzle. The light flitted, bright and dim, working here and there.

For a moment he wondered if he was a bit delirious. The oxygen in his tank was low and his air was bad. His head was heavy and his breathing was a bit difficult. The oxygen cylinder which supplied him had been in use since he had first left the *Moon Bird* nearly thirty hours past. He did not believe it could last more than one passage of the tunnel.

Still he was not delirious. He soon discovered the flitting of the light was caused by a powerful searchlight playing up and down the walls of the abyss. His crew had not abandoned him! Daring untold dangers and rigorous hardships they had somehow gotten a super-searchlight to the very brink of the well.

He shot into the light. It was so intense on his goggles he did not see one of the crew dangling far down into the shaft at the end of a rope, until he passed an arm length out of reach of him. Then for an instant he caught a glimpse of the face behind the airsuit goggles. The man's mouth fell open. His eyes popped as though he had seen a ghost rising upward from the shaft.

Lewis did not wonder that he was startled. He knew the spectacle that he must present, rising in mid-space from the pit, when the man was probably searching for a mangled body.

Like a dummy tossed in air, Lewis rose. His ascent slowed quickly. He clawed at the eluding rope. For barely an instant he halted a stone's throw from the mouth of the shaft, and then down he shot again, passing the startled man. The bright new hope which had risen was snatched as quickly away. Near as were his men they were powerless to snatch him back. There was not enough oxygen to keep him alive through that two thousand-mile tunnel and back again. And even if there was, his startled comrades would hardly expect the bizarre miracle to happen again, unless they guessed he had fallen entirely through the moon.

Even if they suspected that, could they wait for his second trip? Night was closing in on that hemisphere. The oncoming cold would reach near absolute. It would crystalize the rubber sealing of the airsuits and the bodies of the men inside. The chance of rescuing him would not be worth the risk. They might even now believe him dead. His face must show the strain of his fall and the lack of oxygen in his tank. It must appear death-like behind his goggles.

He watched the slope sweep away. Pike's giant form was leaning over the brink. He was dropping something! A short steel cylinder left his arm. Oxygen! Then they believed him still alive!

The cylinder came glistening under the searchlight. It trailed him down the shaft, but to obtain it was another thing. He was travelling as fast as the cylinder. On his backward trip he would pass it, of course, but could he catch it with him falling and it still rising? It was at least a hope.

He wigwagged a message as Pike focused the searchlight upon him.

"Crater goes through moon. Bring Moon Bird other side."

He left the glare of the light which was trying to follow him. Had Pike picked up the message? He could not tell. As night engulfed him he got out his flashlight and repeated the message giving one half the signals with one hand and one half with the other, hoping Pike might somehow piece them together.

After that, timeless gloom enclosed him again. His supply of cartridges became alarmingly small. His strength and nerves were feeling the strain.

By the time he again shot into the sunlight of the opposite hemisphere he was breathing short and fast. His head was giddy and his lungs protested with every gasp of the impoverished air. Without a new supply of oxygen he could not possibly last another trip through the tunnel.

Again he vaulted toward the black, starlit dome of the heavens. The white sun was higher above the horizon. The valley was as hot as a tropical desert already. In a few hours more the heat would be of double intensity.

He scanned the receding surface and the widening horizon for the *Moon Bird* but it was nowhere to be seen. He strained his eyes for the smallest speck in the great black dome above or along the sharp, clean-cut horizon, but there was no hint of the space ship. Even if it did appear it was then too late to swoop under him in time to make the rescue.

● He reached the limit of his ascent and fell again quickly attaining velocity. The oxygen tank rose from the moon surface to meet him. Knowing the risk to his arms he leaned far over and clutched the cylinder as it met him.

For an instant the two inertias strained at each other. He fell down again, but the oxygen was safe in his arms.

Before he was swallowed into the pit he had replaced the old cylinder with the new one.

Breathing was at once an immense relief. It was an immeasurable joy, something to be savored and dwelt upon. It gave him new morale, a new determination to live. Yet his short trip out of the shaft and back warned him of a new peril. Beads of sweat still straggled down his neck and clung to his forehead.

Sixteen hours had made a great difference in temperature. That signified that the heat would be almost intolerable if he was able to stay alive to shoot from the pit again. It meant also that the cold on the earthward side was already intense. If the *Moon Bird* failed him next trip he might as well give up, for the sunward side would soon be a furnace which would melt the rubber sealing of airsuits.

He had little hope of finding the men at the earthward side of the shaft. If they had delayed this long there would be little hope of any of them returning to the space ship. The question was whether they had understood his signals. Or not understanding, would they leave ropes down the shaft and wait in the *Moon Bird* hoping he might miraculously escape and regain the ship?

During that passage, such hopes wove bright threads through his groggy consciousness. His air was good, but he had been without sleep for a long time before falling into the shaft. Time and again the wall was perilously near before he roused to its menace. In a stupor he dozed and dreamed, back and forth, back and forth, he was on a great black pendulum which swept the outer voids of space as it slowly came to rest.

A star of light in the void brought him alert. The star this time was steady. *Pike and the men were gone!*

Lewis clenched his hands until he could feel the give of the rubber coating over the steel mail. He would not say die! Surely the *Moon Bird* was still anchored somewhere on the moon. Surely Pike had left a rope. There must be a chance left yet. He would not give up. These thoughts were crazily running through his mind.

But he did not nearly reach the mouth of the shaft. If ropes were there, they were a long way up from him. Why? With no air, no friction except the small recoil from the exploding shells, why should he begin to drop again hundreds of feet from the mouth of the shaft? Then he remembered his tussle with the oxygen cylinder and understood. His struggle to retain it had lost him inertia. He had lost his chance at a rope when he captured his fresh supply of air!

Down he dropped again, like a drowning man who knows it is for the last time. He lost hope, didn't care, would rather be strangled by the outrush of air which would follow his first contact with the wall than to swing back and forth in that pit of gloom. Then he remembered the clear sun and the open lands at the other end of the shaft. The thought was magnetic. The open called to him. It drew his heart toward it. It dragged him out of his fit of resignation and gave him hope that maybe, in some way, Pike had gone over to wait for him.

That backward trip was worse by far than any of the other three he had made through the moon. Time seemed longer and his morale was low, eaten by the hours of disappointment and suspense. But when he did finally volley, feet first from the pit he saw the *Moon Bird* anchored near the shaft.

It was only then that he remembered that Pike could not possibly have gone around the circumference of the moon while he was crossing its diameter. Of course the *Moon Bird* could make far better time than his mean velocity through the moon, but he had overlooked the fact that Pike and his men would have to creep out of the crater to reach the space ship. That in itself must have taken half the time of his drop through the moon.

The crew were down on hands and knees, clinging to ropes anchored far back. They were hoisting a searchlight into position over the brink.

Every man stopped to gape and stare after him as he shot from the shaft and rose straight into space. Of course none of them had expected that and he had had no time to warn them.

● His first brief relief gave way to hopelessness and then exasperation. Pike had lost the one chance of saving him. And yet Lewis could hardly blame him for not predicting his unprecedented rise into space. After seeing the demonstration it was easy to understand why a body unhampered by friction would swing as far on one side of the gravity center as on the other, and that the extent of the enclosing shaft would not govern the height of his ascent. But such a phenomenon was so unusual as hardly to be foreseen.

If the ship had remained aloft there would have been a fair chance of it maneuvering under him when his rise had slowed his velocity sufficiently to risk contact. Now that hope was gone. Before Pike and the crew could possibly take off, Lewis knew he would have reached his height and again be dropping down. Before the ship could rise to meet him he would have far too much downward momentum to risk contact with it.

He tried to accept his lot philosophically as the crew shrank to the size of toys; stood as though converted into wood. He caught the glint of sunlight upon glass. Pike was watching through binoculars. Lewis wigwagged a signal down at him. He decided to take contact with the ship, regardless, rather than swing through that hole again.

Pike's tiny figure leaped to action. Like mice the crew scurried into the ship. Lewis shot skyward until he could barely make them out as they ran. The ship itself became small; a toy model. It rose and drove straight up.

As his drop began, the ship was coming skyward fast, far too fast. She swelled like an inflating balloon. He could not expect to survive such a crash. Yet he decided to take the risk even if it drove the steel of his airsuit through his body.

"Come ahead," he signaled as he fell toward the ship.

It swelled in size as it rushed him. It grew big and wide all around him. Lewis steeled himself for the impact.

But he had not figured on Pike. A man is not going to obey a command like the one Lewis had given, even if he had always before carried out orders without question. Within a hundred yards of him the ship side swooped, shot on into the sky to loop into a dive. It passed so close to him the long line of portholes were a blur; so near, it seemed larger than the two hundred feet of its diameter. Nearly a mile overhead it made the loop and came diving after Lewis as he fell.

(Concluded on page 89)

(Illustration by Paul)

By now the whole first line of troops was down, silent khaki bodies sprawled . . . "Electrically charged wires," he said bitterly. "They've thought of everything."

THE REVOLT OF THE SCIENTISTS

III—The Final Triumph

By NATHAN SCHACHNER

● The national bank holiday stirred the American people as few things have. It brought them face to face with those mystical things called money, bank credits, deposits and other things the man on the street has always taken for granted.

Mr. Schachner had written the final installment of his masterful "Revolt of the Scientists" around this theme. Scientists take a hand in this tremendous game of dealing with billions of dollars; with the lives of millions. Bankers for once find themselves confronted with forces that they are not trained to deal with. And the result.....we shall see.

Mr. Schachner has pictured very forcefully in this series what would happen should scientists decide to use their gifts in the creation instead of the destruction of lives and property.

● The fat loam of Iowa sank under the repeated thuds of marching feet. From all Pomona County there converged streams of men upon Pomona courthouse, choking the roads with unhurried clumping. Grim, gaunt men, cheeks hollowed from struggle and twenty cent wheat, with rusty rifles and pitchforks on their shoulders.

"Hiyer, Jim!" neighbor recognized neighbor in the tight-lipped flow. "Didn't reckon you'd come. The missus—"

"She aint had nawthin' t' give the kids 'xcept bread an' moldy bacon rind this past six months. 'Sides, Ben Alley's kinsfolks."

Clift Saunders shook his head as he fell into step.

"Mighty strange, this foreclosure. First in years since the banks called this here moratorium. Ben's been paying his interest, aint he?"

"The Lord knows how, but he done it. Now they up and want their money on the mortgage. Ben goes down t' the Pomona bank an' argues. Old Benton, the president, he shifts in his chair, looks uneasy, says somethin' 'bout hard times, bad risk, and sticks to it. Ben says he aint got the money. Benton talks foreclosure. Ben yells: 'Foreclose and be damned' and stomps out. The sale's on t'day."

"Which it aint goin' to take place," Clift remarked grimly, glancing around at the silent, pouring men. "Pomona County's pretty well riled up. Almost everybody's got an open mortgage on his farm, an' if Ben goes out, it'll be a start. Funny, though, old Benton getting hard like that. Maybe a taste o' rope'll be healthy for him."

"Not his fault," said Jim. "Georgie Withers, that's the paying teller down at the bank, tells my Sally the old man's all broken up about it. It was orders."

"Orders from whom?"

"Dunno. Georgie wouldn't say. Seemed frightened when I started to question. 'Pears he said too much!"

The great waste place around Pomona Courthouse was black with farmers, two thousand of them, faces turned to the courthouse steps, where by law Ben Alley's farm was to be auctioned off to the highest bidder to satisfy a mortgage of four thousand dollars. The steps were deserted, but the crowd waited patiently, gripping their weapons. There was no excitement, only a buzzing undertone that was more ominous than the loudest outcries. The sale was to take place at noon sharp, and it lacked ten minutes to the hour.

The sheriff of Pomona County peered out of a barred window. He glanced back at his white-faced deputies, spat casually, and turned to the portly, quivering man at his side.

"Them's folks we all know outside, Benton," he drawled. "Like you an' me an' Ben Alley. Those aint popguns either; there'll be shootin'!"

The president of the Pomona Bank mopped his bald head. His complexion was pasty white.

"You've got a company of militia in the basement, haven't you?"

The sheriff shook his head.

"I didn't ask for them," he said slowly. "They came before dawn, in trucks. Showed me the governor's order. I don't like it, Benton. There'll be a heap o' people killed 'cause of your mortgage. Call the sale off; go easy on Ben."

"I can't," Benton groaned. "The Lord knows I didn't want to start this. It'll hurt business at the bank."

The sheriff stared at him curiously. "Then why—?" he began.

But Benton had seen again through the window the dark masses of men, the dull glint of sunlight on rusty rifle barrels, heard the ominous mounting growl as the minute hand of the courthouse clock twisted nearer to noon.

"I—I'll call him again," he gasped in interruption. "Wait for me, sheriff, I'm going to phone."

He was almost running out of the sheriff's office to the privacy of a phone booth in the corridor. The sheriff watched his portly frame disappear into the booth, spat thoughtfully, and remarked to no one in particular: "A mighty funny business!"

Which, or words to that effect, was what Clift had remarked earlier in the day.

Benton jangled the receiver excitedly. "Operator," he panted, "give me long distance."

It seemed ages before he got his number in far-off St. Louis. It was five minutes to twelve.

"First National? Put Mr. Redmond on; matter of life and death. Hello, Mr. Redmond. This is Benton, of the Pomona Bank. For God's sake, let me withdraw that foreclosure. You don't understand, you don't know! There'll be hell to pay! Five thousand farmers are outside, with guns. Sure, they'll shoot. . . . National Guard? Yes, they're here. How did you know? . . . oh, I see, you had them ordered. . . . Well, there'll be bloodshed just the same. I know the temper of our farmers . . . What, you won't permit it? . . . Then, by God, I'm going to call it off on my own. . . . It's a damned. . . ."

"If you disobey orders," said Redmond coldly, seated at his ornate desk within the Greek temple of his bank in far-off St. Louis, "I shall call in all the paper we rediscounted for you. That amounts to some two hundred thousand dollars, doesn't it?"

Benton knew when he was licked. His voice, ordinarily jovial and booming, was tired and old now.

"All right, Mr. Redmond. We'll go through with it."

"Sorry, Benton," said the St. Louis banker almost kindly. "It's not my fault. I get my orders also."

"From whom?"

But the St. Louis connection was already broken.

● Back in the sheriff's office, the clock bonged twelve times.

"Well?" that worthy asked hopefully. Benton bowed his head without reply.

The sheriff sighed, took an extra hitch on his trousers, picked up the sheaf of foreclosure papers from his desk. "C'm on, Daley," he told the auctioneer. "And you boys," to the tight-lipped deputies, "stand on the top steps and don't show no weapons. Hope that popinjay captain downstairs don't go off half-cock." To Benton: "You're bidding the farm in, aint you?" The president nodded speechlessly.

Out on the steps a dull roar went up. The sheriff began to read rapidly: "By virtue of the power vested in me as sheriff of the County of Pomona, State of Iowa, I hereby offer for sale, in accordance with a judgment of foreclosure duly made and entered—"

Three men pushed forward out of the crowd, and up the steps. A committee; Jim and Clift Saunders were on it.

"Stop, sheriff," Jim said harshly. "There'll be no sale today."

The sheriff spat a thin dark stream of tobacco juice across the weather-worn marble.

"It's the law, Jim," he answered mildly. "Neither you nor me kin stop it." He started to read again: ". . . in the Superior Court—"

Clift grabbed for the papers. The sheriff leaped nimbly back. "Now boys," he said placatingly. But the embattled farmers were already surging up the steps in a grim purposeful way. The sun was ugly on rifle-steel and bent tines.

The sheriff knew his people. "No bloodshed!" he cried to his deputies. "Into the courthouse and lock the doors." Benton and the auctioneer had already fled.

The interior marble echoed with clatter. The National Guard Company poured out, relined on the topmost steps. A half dozen machine guns thrust into position. Bayonets were fixed.

A little fat captain strutted pompously down two steps.

"Stand your ground, sheriff. The sale must go on." He glared down at the temporarily halted farmers. They had not expected this.

"And as for you men, clear out. I'll give you until I count ten. One . . two . . . three. . . ."

Jim turned and shouted something indistinguishable. The farmers milled inconclusively; trying to make up their minds.

"Four . . . five . . . six. . . ."

A shot resounded. Someone in the rear ranks of the farmers had fired. The bullet hit no one.

The captain—he was a haberdasher in real life—lost his head.

"Fire!" he screamed.

There was a volley; the machine guns clattered. Jim and Clift fell, so did half a dozen others. The sheriff turned to protest his horror, but it was too late.

The farmers, grim at seeing their dead, came on with a rush. Another volley and then the two forces met in a swirl of hand-to-hand conflict. Blood dripped steadily from step to step, formed widening pools in the sullen earth. The sheriff was dead, the captain skewered on a pitchfork. Benton was hiding in the cellar, moaning over and over: "I knew it! I knew it!"

. . . . . .

A plane winged eastward, traveling fast. Pat McCarthy, former expert of General Aviation, was the pilot and his passenger Cornelius Van Wyck, millionaire, explorer and adventurer. Both were members of the Council of the Technocrats, an organization of world-famous scientists who were attempting to remodel the world nearer their hearts' desire. Thus far they had been phenomenally successful. The Liquor Ring had been smashed,* the oil industry was under their sole control.†

It was almost a year now since the petroleum industry had been taken over, and the results already were so patent that coal, copper and textiles had voluntarily submitted to the council, happy to have their moribund, dividendless state replaced by assured dividends, even though low and based on factual technologic values. Other sick industries were looking longingly in their direction. Only certain outside pressures held them in line.

The two Technocrats were flying back to their hidden base on the Maine coast with a report of their inspection of the newly acquired copper mines in the Montana fields. Even though the Technocrats were legally absolved from all past alleged crimes, it had been deemed wise to maintain the secret headquarters.

● Van Wyck was jubilant. "Roode will be tickled with our report. Fellowes tells me he can correlate production with any demand we put upon him. And Randolph says he has the copper-hardening process completed. We'll have the steel industry on the run in six months if they don't come in."

Lee Randolph was one of the original Technocrats, former Chief Engineer of American Supermetals. Fellowes was a mining expert, one of the hundred odd technicians and scientists who had joined up after the council's sensational showing. The original group remained in control however.

But McCarthy had not listened to his companion's

*See "Revolt of the Scientists," Wonder Stories, April, 1933
†See "The Great Oil War," Wonder Stories, May, 1933

elation. He was staring downward at the flat Iowa terrain with creased brows.

"What's the matter, Pat?" Van Wyck asked, suddenly aware of his preoccupation.

"Something doing down below," was the brief reply. "I'm taking a look—see. Hold on."

The fast pursuit plane nose dived from the five thousand foot level with a great swoosh. The efficient silencer blanked all other sounds.

Van Wyck gripped his seat and peered over the steeply tilted side. The Roman rotunda of a courthouse bulked shinily beneath. Overflowing to the east was a horde of small, doll-like figures, swaying with unaccountable ripples and jagged movements. Tiny flashes spurted and tinier sounds came thinly to the diving aviators.

"A fight!" Van Wyck said hastily, and reached for the trips of his guns.

McCarthy levelled out at five hundred feet, and circled, trying to make out what it was all about.

Dead and dying were strewn in distorted attitudes over the plain; guns roared with booming concussion. He caught a glimpse of uniforms. Someone thrust up a rifle, fired at the plane.

"Shall I let them have it?" Van Wyck asked hopefully. McCarthy shook his head regretfully. "It's not our war. We'd better be going before some fool punctures us."

Van Wyck said determinedly: "Our war or not, I don't like militia uniforms; and they seem to be winning. Here goes."

Before Pat could stop him, he had picked up several small round bombs from the rack at his feet and tossed them over the side. They hit the earth with a dull thud and opened automatically on hinges. The liquid organic compounds sprayed into the air and oxidized into thick rolling white vapors. Almost immediately the struggling men were enveloped, and almost as immediately they wavered and sank dreamily to the ground, unconscious. Once more had the famous sleep gas evolved by Kuniyoshi, the Jap biologist, and Chess, the German psychologist, proved its worth.

"There's more in this than meets the eye," quoth Van Wyck, staring thoughtfully down at the suddenly silent, smoke-blown shambles. "I'm willing to bet this has some connection with the code radio we received this morning from Roode to come to *World's-end*.* It's the first full meeting we've had in months."

Pat shrugged. "If it's more action, I'm for it. This being a big business man is too monotonous. I was thinking of handing in my resignation."

Van Wyck grinned: "Me too. Step on it."

. . . . . .

A secret meeting was in session in a secluded, closely guarded office on Wall Street. No fanfare of publicity attended its deliberations, nor had any one seen these men enter. Yet the few who were present were men whose every word was solemn front-page news for a gaping public to digest. The real rulers of the country were here.

J. L. Claremont, iron-visaged and dominant, was probably the most powerful man in the world. Very rarely in the public eye, and content to have it so, his network of interlocking banks and web of affiliate companies controlled, if the truth were known, the greater part of the industrial and commercial life of the nation. A worthy subordinate was Willis N. Borden, head of the State National Bank and allied enterprises. A little to one side was seated Franklin Dennis, new chairman of General Power, Adam Roode's former employer. His fine aristocratic features were in sharp contrast to the fleshy, gross lineaments of his supposed rival, Harvey Belding, who perched precariously on top of a system of pyramided holding companies to maintain control of the great Mid-Continent Utilities Co.

Other internationally notorious captains of industry were present; notably Carter English, representing the Consolidated Railways; Robert P. Theodore of American Radio and Television; and J. B. Lawrence, of American Supermetals.

Lawrence was speaking earnestly, fist pounding the table, benign-seeming face aflame.

"I tell you, the impudence of those damned Technocrats is beyond belief. Imagine, only yesterday they served me with an ultimatum! Turn over the steel industry bag and baggage, or they'll run me out!"

He snorted and laughed in a false attempt at derision. But no one echoed him. These men listened solemnly.

"I understand," said Dennis quietly, "that they have developed a process for hardening copper. If that is so, with their control of the copper industry, I'd assume that they meant what they said."

Lawrence glared at him. "I suppose," he stated with heavy sarcasm, "you suggest that we yield humbly to their demands and beg for the crumbs that are left."

"No; I don't say that," Dennis stated even more quietly. "We are here to organize a plan of campaign to crush them, once and for all. But we must not make the fatal mistake of underestimating them. They are brainy, courageous men. I know Roode, and you, Lawrence, certainly ought to know Randolph. He helped make your industry what it is. Harmon has shown what he can do with oil. They have Van Wyck's millions in back of them, and oil, coal, copper and textiles, not to speak of the blind admiration of the people, who see in them and their gospel a way of escape from a decade of depression." He shook his head gravely. "We'll need every ounce of our resources to beat them."

"Bunk!" Borden, the banker, broke in violently. "Don't make demigods of them, Dennis, simply because you still have a sneaking liking for that old renegade, Roode. They've not met any real opposition as yet; just small fry. They'll be begging for mercy within a week."

"Stoneman was not small fry," English pointed out.

CHAPTER II
A Secret Meeting

● Claremont smiled tolerantly. Instantly there was silence, and everyone leaned forward to catch the slightest intonation of this Power among Powers.

"Old Stoneman was pretty good in his day," he said. "But he is old and he stubbornly persisted in a dying industry. The world has swept past him. I've been listening to you gentlemen. You are afraid! Of what? A group of scientists, good enough in their field, but going out of their depth. What have they done? Oil? Coal? Both superseded by water power; Dennis and Belding, you ought to know that. If tomorrow we cut the price of broadcast power in half, we drive them out of business. Textiles? An anachronism, with rayon and

*The name of the secret, camouflaged base of the Technocrats on the Maine Coast.

fiber cloths in general use. Copper, I grant you, I overlooked. Control slipped out of my grasp. A paltry few millions to back them. Nonsense! In a month the very name of Technocrat will have been forgotten."

"Why not have the troops called out?" asked Belding eagerly. "Claim conspiracy, treason, rebellion, anything. The courts will back us up. You can do it, Claremont."

"Of course I could," the banker overlord replied with a touch of annoyance, "but I won't. You are all too crude; there is nothing of subtlety in your suggestions. Call out the army, and have a real revolution on your hands. It would give the Technocrats the chance of their life to raise the people against oppression, tyranny, what not. *I'm* handling this, and my own way."

His cold eye moved around the circle. There was respectful silence; no one dared dispute his domination.

"The time has come," he continued impressively, "to gain complete control of the country. Our present so-called democracy is a sham and a failure. We have shown that in the past; Technocracy is showing it now. The real rulers must have the outward power. We have left too many enterprises, too many industries out of our grasp. We must take them over, in one sweeping movement. Then we can starve the Technocrats out, crush them without open violence to arouse the nation. Legally! With proper ethical banking and business practice that the people are accustomed to; that they never had the brains to question."

"But how will you do that?" Theodore asked uneasily.

Claremont withered him with a contemptuous eye.

"Simple as A B C. We hold here, between us, working control of a majority of the nation's industries. They have a perfect right to refuse to sell their goods or service to anyone; that is good business practice. The industries which refuse to come in, are starved out. As for those controlled by Roode and his gang, there is to be no quarter. The whole country arrayed against them; no supplies, no credit. Let them make their own machinery, build their own buildings, grow even their own food."

"You forget the copper-hardening process," Dennis interposed again. "Perhaps they won't need our steel."

"You mentioned food, Mr. Claremont," said English curiously.

The banker smiled. "Why do you think I started mortgage foreclosures? To control food. It is even more essential than steel. No one can trace it to me. Every little bank or company with mortgages received orders from some other bank or company holding its paper. They in turn heard from others that held theirs. A few big ones took commands from a certain company that made it its business to obtain strong stock interests in them. That holding company is a dummy corporation for J. L. Claremont & Co.

His smile widened complacently. There were little murmurs of admiration.

"Test foreclosures," he went on, "were carried through successfully in widely scattered localities. Purely local affairs. They are accustoming the farmers to the end of the unofficial moratorium. Later they will grow in volume. We reinstate the farmers as tenants, subject to every control."

"There was trouble in one of them," observed Theodore.

Claremont passed it off.

"Just in Iowa. The militia captain was excitable; there was a battle."

"It had a curious ending," said Lawrence. "The papers are full of it. All the combatants suddenly went to sleep, wounded and all. No one knew what it was all about when they woke up; some claim to have seen an airplane circling above them."

The great banker said indifferently: "A mere natural phenomenon. The papers are playing it up."

"No," said Dennis suddenly. "It's deadly serious—to us."

A chorus of exclamations. Claremont frowned. "What do you mean?"

"This. Remember that memorable meeting of the Petroleum Institute?"*

"Yes," some one said.

"The Institute went to sleep in exactly the same way. Gentlemen," Dennis looked slowly around an intent circle, "the Technocrats have already taken a hand. They know somehow what we're up to and that was their answer."

● Excited babble. Dark red suffused Claremont's features.

"You're right," he nodded. Then anger flared. "By God, we'll break them fast, without finesse. Let the farms wait." He pressed a buzzer.

A slim dark secretary entered.

"Miss Meehan, get me the portfolios on oil, copper, coal and textiles."

She withdrew silently, to reenter in some moments with bulky black leather cases.

Claremont ruffled through them.

"Ah," he exhaled satisfaction. "It will be simple. A total of eighty odd millions still outstanding in call and short term loans to Oil, sixty-eight millions to Coal, forty-nine millions to Copper, and thirty to Textiles. All held by banks and institutions we control, directly or indirectly, or can bring pressure on. Furthermore, outstanding merchandise bills total some fifteen millions; all due or to become due in thirty days. Our banks hold paper of most of these firms."

No wonder Claremont is what he is, thought Dennis. He has everything at his finger tips.

The banker closed the portfolios, leaned back with a gratified air. "Easier even than I thought. We call everything at once; loans, outstanding accounts. Flood them with demands today; start simultaneous suits tomorrow. Close all avenues of credit. Over a quarter of a billion due, in cash. It will be impossible for them to raise it, or anything near it. We apply promptly for receiverships; take over reorganization, work into control. The Technocrats are out—through; and legally! A horrible example to the men in the street of scientists trying to run big business!"

The others were fulsome in their flattery; even Dennis admired the scheme. It was impeccable, perfect! They dispersed jubilantly through surreptitious exits. . . .

Such were the far-reaching consequences of Van Wyck's casual tossing of a few sleep bombs among the warring elements at a local foreclosure in Iowa.

. . . . . .

At the same time a tall, monocled Englishman rose from in front of a queer photoelectric cell arrangement.

*See "The Great Oil War," WONDER STORIES, for May, 1933.

He was a recent tenant occupying a small office in the Wall Street building.

He clicked a button and the mechanism stopped whirring. He was smiling slightly. The Englishman, typically Oxford and Saville Row, was Lord Wollaston, the world's greatest authority on mathematics.

Some months before he had worked out conclusive mathematical proof of his pet theory that light, being an electro-magnetic phenomenon, or an ether disturbance, if you wish, could not be completely obstructed by the most opaque substances. Granted that most of the waves were turned back by solid, non-transparent substances, a certain number managed to squeeze through. One thousandth of one per cent, he found, for lead, one millimeter thick. Progressively smaller percentages for greater thicknesses. Of course entirely too small to affect the human eye or even the ordinary photoelectric cell, sensitive to light from all sources. But—he went into consultations with Roode, atomic physicist, and Silversmith, radio expert.

This new type cell was the result. It was sensitive to the light emanating from a candle one thousand miles away, and most important of all, could be focussed.

In the present instance, he had carefully measured the distance from his rented office to the secret room where Roode had suspected the meeting was to take place. The instrument was focussed for that distance and pointed correctly. As a result only the light from the interior of the room, filtering feebly through a dozen walls, impinged on the sensitive cell. It reacted on a highly magnifying motion camera in the back of the box. This was Wollaston's own invention.

Accordingly he had a complete picture of what had taken place. Experts could decipher from the movement of the lips exactly what had been said.

Adam Roode surveyed his council grimly. His long lean body was tense. Everyone was there under the camouflaged roofs of *World's End*. No one had seen them come to that wild, deserted refuge on the Maine coast. Not even the new recruits to Technocracy knew of its existence.

Lord Wollaston's film had just been run, and Chess, the psychologist, had deciphered sufficient from the movements of the actors' lips to tell a coherent story.

There was somber silence. The full impact of Claremont's plan left them slightly stunned. Even Van Wyck, reckless fighter, was grave. These were weapons that could not be met with the machine guns and hydrogen bombs that had served so well against the Liquor Trust, or with the scientific weapons that proved successful against Oil.

This was something intangible—credit; money—and therefore so real as to be the mightiest power of all in modern civilization. His own millions gave him that realization.

Peter Dribble, Roode's assistant, and Van Wyck's particular friend, said with slight bitterness:

"So Van Wyck's sporting gesture with the sleep bombs precipitated matters. Claremont wouldn't have acted so fast if it hadn't been for that; we would have had time to prepare."

● Peasley, world famous chemist, said sorrowfully: "I was hoping he'd keep his hands off until we were better intrenched."

Van Wyck started to say something heated, but Roode interrupted. His eyes flashed with their old fire.

"You talk like children. Claremont had already started to move. We were stepping on his corns. Don't you think I knew when we drafted the ultimatum to Lawrence that he would run to Claremont, who controls the Board of Directors? The foreclosures were his first step—an obscure one, I should say. As soon as we start war against Steel he would have to move faster. I welcome this complete openness. It gives us the chance to do things we otherwise would not have dared to do, for fear of the government, of alienating people to whom banks and bankers are still sacrosanct."

"But what *can* we do?" Dr. Myran, the surgeon, asked anxiously. "We can't meet a quarter of a billion."

"Of course not," responded Roode. "But we can counter-attack. We are prepared. Listen to this."

It was far into the night before the weary council broke up, but there was springiness in their steps as those who were to remain went to their sleeping quarters, and those with definite assigned tasks departed in silenced planes, taking with them strange looking boxes.

. . . . . .

The morning of June 8th, 1940, Claremont's plan went into effect. The post office staggered under an unheard-of avalanche of mail. Millions of formal notices to every little business, every medium sized corporation and gigantic combine, every wage earner who had signed a note for a personal loan or endorsed one for a friend; every middle class person who had purchased an automobile or a radio or a vacuum cleaner on the installment plan; every farmer, home owner, and holder of real estate whose mortgage was open, overdue, or who had permitted the slightest default in interest, taxes or assessments; every purchaser of merchandise on credit; and of course, inconspicuously and naturally included, every industry controlled by the Technocrats.

John Jones, typical American small business man, cracked his three-minute eggs moodily. Business was rotten, nobody was paying his bills, and he had a hangover from a late poker session the night before in which he had been nicked to the tune of five bucks. Maybe the Technocrats were right after all.

"Good Lord, Madge, what's all this?" He stopped his steaming cup of coffee half way to his lips, and stared at the batch of letters his harried wife dumped silently in front of him. There were dozens of them. "Did I become president or something over night and the nation's sending congratulations?"

Madge shrugged work-worn shoulders.

"Looks more like bills to me."

"Bills!" he exploded. "I couldn't possible owe that much." Coffee was forgotten. His finger sliced through the envelope of the first one. It was from the building and loan institution holding the mortgage on their little home. A very polite note.

"We note with regret," it ran, "that you have failed to meet the water tax due May 15th. In accordance with Paragraph 9 of our mortgage, we are therefore compelled to declare the entire amount of the principal and accrued interest as due immediately, and to notify you that unless same is received not later than tomorrow noon, foreclosure proceedings will be commenced forthwith."

There was also the following cryptic addition:

"It is strongly suggested that in order to raise this sum or any part thereof, you immediately make demand for payment upon all persons who are in anywise in default on bills, notes, or other instruments due to you."

John Jones was stunned. He looked with haggard eyes at his patient wife. "It—it's impossible! We've never paid our water rates until around July; the company knows that. They won't—they *can't* do this to me."

He opened letter after letter with fingers that trembled uncontrollably. The milk company, telephone and electricity, all with formal urgent demands for immediate payment. The third payment on the shiny new car was two days overdue; accordingly, in accordance with Paragraph 10 of the conditional bill of sale, the whole amount was declared due and payable. A lending institution, for whom he had endorsed a friend's note in a moment of weakness, made sudden demand for the whole. And every letter ended with the same cryptic phrase.

John Jones ran out of the house that morning with food ungulped, leaving a tear-reddened wife and small unknowing children behind. The world was coming to an end! He must think; see what he could do at the office.

There it was even worse. Wholesalers who had carried him for months suddenly clamped down hard. That note at the bank, which he had discussed with the cashier only last week, and which was certainly going to be renewed, was just as certainly called.

Foreclosure, bankruptcy, ruin, the loss of everything he had worked so hard for, stared him in the face. He grabbed the phone violently.

"Mr. Glass," he said to the bank cashier, "you promised me—you know you did!"

"It wasn't a definite commitment," evaded Mr. Glass, who himself was wondering what it was all about. His desk was piled high with demands calling everything that was callable against the bank. The president had given abrupt orders for the cancellation of all credit, had even gone to the trouble of dictating the exact form of letter to be sent out. No explanation; but the cashier had observed he wore a harried look and locked the door of his private office when he was on the telephone. "Tell you what, Jones; why don't you dun all your own accounts in the same way—right now. Use our form letter. Maybe we'll see, if you do the right thing. Times are hard, you know, must lay our hands on every cent."

CHAPTER III
A Nation in Chaos

● John Jones hung up with a curse. All his wrath transferred to the people who owed him money.

"Miss L." he shouted, "bring your book for dictation, and get me the accounts ledger. The dirty so and sos, not paying their bills when I'm stuck like this. I'll fix them. Here, take a letter to Blank & Co.; say. . . ."

And so it went in hundreds of thousands of homes and offices that Black June 8th. The nation was being called for payment to the tune of almost two hundred billion dollars! There wasn't that much money in the world, much less in the United States. To such a tremendous extent had the credit structure of the country reared its ungainly head, and made it possible for the masters of credit, to wit, the bankers, to cause their puppets to dance to a tune of their own making.

By ten A. M. newspaper extras were flaunting the streets; by ten-thirty a much bedevilled President was calling a hurried session of his cabinet to consider an unprecedented situation. The nation seemed to have gone mad simultaneously. Everyone demanding money from everyone else, in a sudden hysteria of fear. True, the depression had steadily widened and deepened, but why this crashing debacle?

Morse, Secretary of Treasury, ventured a timid opinion. He uttered the cloud-enshrouded name of J. L. Claremont. The President shut him up at once. Claremont responsible? Nonsense! He was a patriot, a public spirited citizen. Besides, this was beyond even his far-reaching powers.

But certain newspaper reporters, more realistic, hovered outside the august sanctum on Wall Street. Others of their brethren hurried from frantic interview to frantic interview with smaller fry; bank presidents, leaders of industry. Everyone was vague, most of them honestly so. Some one in a position to dictate had called them, forcing them to call others. Only the few of the Inner Council of Claremont *knew*.

By noon there were tremendous runs on the banks; by one o'clock the President, in solemn proclamation, had declared a banking holiday, to extend indefinitely. He had wished to declare a moratorium on all debts, but Chase, the Attorney General, had delivered himself of an opinion that such a course would be unconstitutional.

Claremont sat tight throughout the turmoil, smiling like a benevolent Buddha, and issuing orotund oracles to sceptical reporters. The situation was unexampled, he declared, but understandable. The credit of the country had been steadily deteriorating; people had purchased beyond their means, banks were compelled to draw in their horns. But let the country not fear. He, J. P. Claremont, was working night and day to reorganize the credit structure, put it on a sounder basis than ever, etc., etc.

"Baloney," muttered one reporter profanely under his breath, and kept on taking notes respectfully. The evening editions carried the statements; it restored a measure of confidence; prevented incipient revolution.

Claremont smiled even more broadly in the bosom of his Inner Council, invoked for the ostensible purpose of considering the situation in the interests of public welfare.

"Everything is working out according to schedule," he said. "The closing of the banks puts us in an even better position. The President doesn't know that I caused that idea to reach his ears. The cash of the country is tied up in our possession. Already the industries we are interested in have made overtures. With receiverships staring them in the face, they won't hesitate to accept our terms. Within a week, control will be in our hands."

"And the Technocrats?" suggested Dennis quietly.

Claremont's face hardened.

"They are through," he said. "We give them no terms, no quarter. Tomorrow, actions will be commenced against all corporations under their control for the appointment of equity receivers; foreclosures of property. My agents have instructions to work fast."

The door opened quietly. Miss Meehan, his secretary, said: "Mr. Roode and Mr. Van Wyck to see you, sir."

A bombshell could not have evoked more commotion. The Technocrats were bearding the lion in his den!

Claremont was the first to recover. "Show them in," he said. "Coming to beg for terms, eh?" His domineering gaze swept the circle, his strong gnarled hands opened and squeezed tight. "We'll crush them, like that."

Dennis' aristocratic face was serious; it partook of none of the exultation of approaching victory that spread over his colleagues' countenances.

"Be careful, Mr. Claremont," he warned. "These men are most dangerous. If you would permit a suggestion—"

"Nonsense!" Claremont boomed. "I'll handle them. They'll be crawling."

Old Adam Roode, grimly set and more the down-east Yankee than ever, and Cornelius Van Wyck, carelessly smiling, were ushered into the room.

"Ah!" said Claremont with massive benevolence, "you come to—"

"We come for several reasons," Roode interrupted. He wheeled on Lawrence, the steel magnate.

"You have not answered our ultimatum," he said. "We demand an answer, instantly."

Even Claremont fell back at the colossal effrontery of the man.

"W-what?" Lawrence gasped. "Y-you have the nerve to repeat that insane gesture—now!"

"I take it then that you refuse," Roode told him brusquely. "Very well. We start production at once on our copper-hardening process. The market will be flooded with low cost metal every whit as good as your best steel. In a month you'll be begging us for mercy."

● The lion started roaring. Claremont's poise was gone; he pounded the table.

"You'll soon sing another tune," he shouted. "You're here to take orders, not to give them. Your industries owe a quarter of a billion; tomorrow we start taking them over. You are through," he shouted more loudly, "*through*, do you understand? Your noble experiment is over."

Roode faced him unperturbed, while Van Wyck grinned at the others.

"So," said Roode softly, "our suspicions were correct. This whole mess can be laid to your door. You started it as a cloak to wipe us out of your path. We are a menace to your profits, to your power of life and death over the country."

Claremont hesitated, then plunged.

"And if it is, what can you do about it?"

"This," said Roode harshly. "We'll wipe *you* out unless *our* terms are accepted now, at once."

His long bony finger flicked out at each man in turn. "Lawrence, to turn over Steel; Theodore, his communication lines; English, the railways; Belding and Dennis," his face softened slightly at the sight of his old chief, then hardened again, "the utilities"; Borden he disregarded contemptuously, "and you, Claremont, all control over your banks."

A wave of derisive laughter swept the room. Belding's coarse face turned alarmingly purple in a very ecstacy of mirth; even Claremont permitted himself a slow chuckle.

Only Dennis did not seem to thoroughly enjoy the high comedy of the occasion. His eyes had never left the face of the scientist whose brain he had always respected; his own was deadly serious.

"I would suggest," his thin voice cut dryly across the general hilarity, "that we listen to Mr. Roode with attention." He turned to the scientist. "Suppose," he said, "your loans and general indebtednesses are extended to their normal business periods; would you be willing to withdraw all of your demands, including that on Lawrence?"

Claremont was on his feet, glaring.

"What infernal nonsense is this? Be careful what you say, Dennis, you've been acting suspiciously of late. Roode, you play your comedy well, but it is of no avail. You had better seek a nice quiet lodging place somewhere out of the United States, where the rent is not excessive. Your little period of strutting is over."

Roode said to Dennis, ignoring Claremont.

"You see how really shortsighted your colleagues are. You will have the pleasure of telling them so later on. But for your own peace of mind, matters have gone too far for us to have accepted your proposition. It is war to the bitter end." He flung to the others: "You are quite smug and secure about your power. But what is it based on? Money and credit! Money—that means gold in the last analysis; credit—mere scraps of paper; mortgages, notes, stocks, bonds, contracts; that is all. Without that, what are you? Nothing, nothing at all! Good day, gentlemen."

He stalked out of the lion's den with majestic tread. Cornelius bowed ironically, and followed.

Claremont pressed a whole battery of buzzers. Subordinates came scurrying in, orders flew thick and fast. The lion was exerting all his strength to crush these pernicious insects who dared talk back to His Majesty.

But Dennis shook his head. Now what had old Roode meant by his last retort? He was not accustomed to using random phrases.

. . . . . .

Morning of June 9, 1940!

A hundred firms of lawyers scattered over the country rubbed palms together in high glee. The depression, the long lean years, were over as far as they were concerned. Stenographers typed madly, managing attorneys dug into form books for precedents, senior partners dictated the orotund sentences of legal phraseology, secretaries made cryptic pothooks in their notebooks, clerks dashed to the courts to file papers.

A thousand actions were beginning to grind their legal way, with a thousand different plaintiffs; but only a few defendants. Oil, Coal, Copper, Textiles, and the individual Technocrats!

Claremont was acting!

. . . . . .

● A well dressed, prosperous looking man walked briskly into the great banking institution of J. P. Claremont & Co. A long steel box was under his arm. He headed straight for the window marked "Vaults."

"I wish to rent a vault," he told the clerk. "A private vault, mind you, not a safe deposit box." He indicated the steel container under his arm with a laugh. "I was fool enough to accumulate a lot of worthless papers during the boom of blessed memory—you know, stocks like Steel and Telephone and Radio. Paid through the nose for them, too. It's a question of using them for wallpaper when wallpaper comes back into style, or putting them out of sight."

The clerk grinned understandingly, albeit respectfully. He pushed out some papers for signature. The well-dressed man adjusted his glasses, read each document carefully, signed slowly, and pushed them back across the counter.

The clerk looked them over. Everything seemed in order. The name of the prospective customer was soundly Anglo-Saxon, the address impeccable, the two references men rated as triple A in Dun's.

"Everything is quite all right, sir," he said politely. "In two days your vault will be ready."

The well-dressed man grimaced, and indicated the box under his arm, "I must have it at once. You see," he explained, "I'm leaving on the evening boat for Nova Scotia. A month's fishing trip—for my health."

The clerk, who was a disciple of old Izaak Walton, himself, smiled and sighed. His fishing was confined to week-ends in the Catskills.

"All right," he said doubtfully, "under the circumstances. We usually check up references, but yours—. Here's the key." He thrust it out. "Shanley, take this gentleman down to Vault 36A."

A gray-clad guard ushered the well-dressed gentleman, still tightly hugging his box, into the bowels of the earth, past enormous steel doors literally covered with intricate mechanisms, fireproof, burglar proof and explosion proof. Millions of dollars in gold rested quietly within; the great bank's gold reserve. Claremont did not trust even the United States Treasury.

The new customer did not flick an eyelash as he went by. At the farther end the guard stopped, chose an intricate key from a bunch at his belt, swung open the steel outer door of a private vault. Inside was disclosed a second steel door.

"Your key opens that one, sir," the guard said.

The gentleman nodded, fitted his key into the lock, swung the door open. Inside was a cubicle of steel some three feet in dimensions, illuminated by a tiny electric light that shut off automatically as the door swung to again.

The guard lounged nonchalantly against the smooth steel side, and therefore did not notice the customer's thumb pressing against the lowermost corner of the box before he placed it carefully within the vault, making sure that the end of it contacted with the inner steel wall.

Then he locked the door, and straightened up with a sigh of satisfaction.

"I'm glad that's safe now," he said.

"You don't have to worry, sir," the guard assured him as he closed the outer door. "Nobody can touch that vault but you. You'll have to sign your signature next time you come, for identification."

The well-dressed gentleman smiled slightly. He was never coming back!

"Good day," he observed pleasantly.

"Good day, sir," answered the guard. . . .

Later on in the day another man rented a vault under almost identical circumstances, except that his need for hurry was an operation he was about to undergo. He was given a vault on the same tier, but at the opposite end. The vast gold vaults were sandwiched in between.

. . . . . .

Three men stood in contemplation before a complicated maze of apparatus in an old abandoned brewery in East Nineteenth Street, whose wall was flush against the East River. It may be remembered as the original Headquarters of the scientists when they organized and fought the Liquor Combine. Since then it had been broken into by the police and searched, but certain things had escaped their vigilant eyes. Such as, for instance, the concealed trapdoor which led down into the lock extending into the waters of the river.

On Ribling's death at the hands of the racket, his estate had sold the old brewery at auction. An obscure individual had bid it in cheaply, the deed was recorded, but the place seemed as blankly shuttered and deserted as ever.

The three men were Adam Roode, Alfred Silversmith, world-renowned radio expert, and Cornelius Van Wyck. Swinging slowly with the current in the lock rested a submarine, with a crew of two on board, waiting.

"Everything set?" asked Van Wyck.

"Everything," said Silversmith, his dark eyes aglow. "Look," he pointed to a knife-switch set on a bakelite panel against a flare of blue-glowing electron tubes. "When I throw this switch, it sets a powerful beam-current in motion attuned to impinge on the mechanism in the boxes in the vaults. That mechanism is in two parts. One is a transformer capable of stepping up the intensity of the current a hundred thousand fold. The other, of my own invention, is a device which plays alternating electrical impulses through the steel walls and across the gap between the two boxes at an almost inconceivable rate of speed. In fact, they have been set to correspond exactly with the rate of vibration of certain definite orbits of electrons within the gold atom."

"What would that do?" asked Van Wyck, the layman, deeply interested in the almost daily scientific miracles evoked by his colleagues.

Roode told him. This was his special domain. "The waves of energy, vibrating in unison with the electrons, will naturally amplify their vibration periods, and in so doing, kick them out of their orbits. They will then necessarily be lost to the atom. We have calculated carefully and set our vibration periods to knock off sufficient electrons from the gold atom, which has an atomic weight of 197.2, to bring its weight down to 119."

"But wouldn't the entire atom disappear?"

"No. Each orbit of electrons has a different vibration period."

"And the final result will be—?"

"Tin! A valuable element in itself but not nearly as valuable as gold. Furthermore it is not a medium of exchange, and that is what bankers are primarily interested in."

Silversmith was pacing impatiently. He took these things hard.

"Ready?"

"Ready."

The knife-edge contacted, the blue flares brightened, there was a loud humming sound, and powerful waves flung themselves with the speed of light to their destination.

CHAPTER IV
Retaliation

● The machinery of the law, activated by the powerful catalysis of Claremont and his colleagues, for once, was whirling rapidly. Judges shut their eyes determinedly and signed orders for the appointment of re-

ceivers *pendente lite*, endowed with the most sweeping of powers. The basis for such a move was the allegation of insolvency, pending suits, and possible dissipation of assets to the irreparable harm of the plaintiffs, etc., etc., in the matter of Oil, Coal, Copper, and Textiles. Perfectly legal, even to the appointment of receivers who were henchmen of Claremont.

The newspapers smelled a rat, in fact, a couple of rats. The stench was terrific. Yet they dared not say anything, and wouldn't if they dared. After all, their owners' interests were tied up with the rest of the money-eyed men against the Technocrats.

For strangely enough, no actions had been commenced against any other industry involved in the wholesale demands for payment except a few small too independent independents who were better crushed anyway. The big ones came into the vast weave being deftly thrown over the shuttle of the country's future. Their heads also realized the menace of the Technocrats.

Only the man in the street did not realize what it was all about. He saw, and was carefully told, that J. P. Claremont, that great man, had stepped into the breach and saved the country from panic and worse.

Big business had miraculously freed itself from the nightmare, was being combined into a giant merger that would render impossible such a condition in the future; and so forth and so on. Only certain industries were too far gone, too rotten financially, to be saved under their present management. Needless to say they were the ones controlled by the Technocrats. But pending litigation would soon take care of that.

And so John Jones, whose note at the bank had been renewed, and whose home was saved by the gracious waiver of default by the building and loan association, nodded his head while he expansively smoked a good five cent cigar.

"I'll bet it was those Technocrat fellows all the time," he remarked sagely to his wife. "They're responsible for this panic. If we'd run them out of the country, the depression would be over. Yes, sir."

Forgetting of course that the depression long antedated the advent of the embattled scientists, and innumerable similar small details. But then John Jones, typical man in the street, believed everything the newspapers told him except the weather forecasts, and did not use his brains any more than he could help.

. . . . . .

The great Claremont looked around the exultant circle of his council. He accepted their admiring congratulations with becoming modesty.

"We are completing a great work," he said. "The superholding corporation has elected us directors. We control seventy-five per cent of the nation's resources right now. Receivers are moving into possession of the Technocrats' properties. They have no defenses to the actions. Within twenty or thirty days, depending on the State, default judgments may be entered. The banks reopen tomorrow, but with restrictions. At their option, they may demand sixty days' notice for the withdrawal of moneys. That will effectually cut off any possible chance for the Technocrats to salvage even the smallest of their plants. The set-up is perfect."

"It looks that way," Dennis agreed in a doubtful tone. "But somehow I don't like their silence."

"Why wouldn't they be silent?" interposed Belding. "They're licked and they know it."

There was a commotion in the outer corridor. Some one knocked hurriedly, imperatively on the door. Claremont frowned. There was a guard outside, and no employee had ever dared interrupt a meeting like this before.

"Come in," he said, inwardly determined to fire both employee and guard.

The door slammed violently open, and a man, his face drained white of all color, literally catapulted into the room. Over his twitching shoulder could be seen the anxious face of the vault guard.

Claremont frowned portentously. "What is it, Jenkins?" Jenkins was the confidential clerk in charge of gold shipments. The great banker had entrusted him that morning with the task of earmarking four and a half millions in gold coin for the Bank of England and thus close a very delicate and withal secret transaction.

Jenkins leaned heavily against the table, trembling like an autumn leaf. His mouth gulped continuously, yet no words issued.

"Speak, man," Claremont snapped. "Are you drunk?"

With great effort the mouth opened again, and words issued gaspingly: "The gold! The gold!"

A cold hush broke over the assembled financiers.

"What about the gold, you fool?"

"It—it's gone!"

Everyone was on his feet now. Claremont strode over, gripped the cowering clerk, shook him violently.

"You're crazy, man. The gold gone! Where?"

Jenkins almost slumped to the floor.

"It's not my fault," he quavered. "Yesterday I checked all the vaults. Eighty-five millions in gold coin to the penny. Today I went down to earmark the payment to the Bank of England—Shanley was with me, weren't you, Shanley?"—the gray-clad guard nodded in a frightened sort of way, "and I opened B vault, and the money was gone. I—I lost my head, I'm afraid; opened vault after vault." His voice fell to a whisper. "It was all gone."

● Clarement's face was the face of a man who does not wish to believe. "You're drunk, the two of you," he said roughly. "How could eighty-five millions in gold coin disappear out of vaults? Were the mechanisms tampered with?"

Jenkins shook his head. "No sir. Everything was in order. The usual guards had been continuously on duty; nothing suspicious had occurred; no one even approached the tier except vault holders and in the presence of a guard."

Dennis bent forward slightly. "Were the gold vaults completely empty?" he asked softly.

"Why no, sir," Jenkins said surprised. "In my excitement I forgot to tell you. All the vaults are filled to the brim with a fine grayish powder."

Dennis made no effort to conceal his excitement. "Do you know what that powder is?"

"No sir. But Shanley," he indicated the guard, "recognized it. He used to be a miner when he was young. He says it's *tin!*"

There was a babble of confused sounds. Consternation stared openly on each face Eighty-five millions of gold gone, and worthless tin powder substituted in its place!

Claremont's voice dominated the chaos.

"Jenkins, give immediate orders to close the bank doors. No one is to leave until I give the word. Shanley, round up all the guards, day and night shifts, for questioning. Borden, get Hearn's Detective Agency on the wire; I want Hearn himself and his best operatives down here in fifteen minutes. We'll thrash this matter out here and now. This is an inside job."

"It won't do you any good," said Dennis.

Claremont stopped his fierce pacing.

"What do you mean?" he roared.

"I mean that the Technocrats have acted, as they threatened to do."

"Poppycock! They're not magicians."

"No, but they are scientists, who are even more powerful. Remember what they did in the oil industry."

Claremont's furious retort was checked by the insistent burr of the telephone. He picked it up.

"Mr. Roode wishes to speak to you, sir," said switchboard.

The great banker gulped, and then Roode said:

"Have you reconsidered our proposition, Claremont?"

His watching colleagues saw his face mottle with apoplectic anger.

"No, damn you," he roared. "I'll see you in hell first. You've put your head into a noose this time. That gold—" He stopped with labored effort. His anger had made him say too much.

"The gold?" Roode repeated innocently. "What gold? Don't tell me my prediction has come true?"

"What's that?" asked Claremont unwillingly.

"That gold would eventually turn to tin. For years I've predicted that. The gold atom, you know, is a *very* unstable affair. Shouldn't have lasted even thus long."

"Then you *were* responsible?" said Claremont slowly, half awed. "This means jail for life."

"If you can catch me," Roode mocked. "By the way, tell Borden and the rest of your banking friends to look in their vaults. This gold disintegration disease spreads like wildfire. When you are ready to submit, use the radio. I'll be listening for you. Good bye."

Claremont mopped a moist brow; then commenced to act with the thoroughness that had made him famous.

The telephone call was traced. A blind lead; it had been cut in on a main trunk wire near Yonkers. A general alarm was broadcast for the immediate arrest of each and every member of the Council of Technocrats. None could be found at their usual duties. Only subordinates in charge who maintained stoutly that their chiefs had left two days before without a word as to their respective destinations. Nation-wide check-ups on hoarded gold disclosed that the State National Bank and half a dozen others had suffered similar losses. A hundred and fifty millions in gold had vanished, leaving plebeian powdered tin in its place! At the insistence of Secret Service men nothing was touched, not the slightest speck, except a small quantity for analysis. They checked and rechecked the life history of every employee in the stricken banks; searched for finger prints, opened private vaults.

There they found something. Steel containers holding indistinguishable debris; the result of time bomb explosions. The names and addresses of the owners were checked. Responsible citizens, every one of them, but unanimous in vehement denials that they had rented the vaults or authorized any one else to do so. All trails blind alleys!

In spite of the most rigorous efforts at secrecy, the news leaked out. Rumors magnified the extent of the calamity. Nervous depositors descended on the banks throughout the nation in hordes, standing in long panicky queues for hours before they opened, for hours after they closed.

The Federal Reserve, the United States Treasury, rushed gold and currency shipments to the beleaguered banks, but could not stem the rush. There wasn't enough money in the world to stem it!

. . . . . .

● Claremont and Borden sat in conference with the President of the United States, his cabinet, the Speaker of the House, and certain key senators.

"This has gone far enough," said Claremont. "These Technocrats must be put behind the bars for life; hung, if necessary. Mr. President, you have been too lenient. Stoneman warned you; yet you did not act. He yielded, and you yielded. Now they have grown bold with immunity. A great nation lies prostrate."

"You've brought it upon yourself, and upon the rest of us," the President pointed out sharply. "Had you not attempted to disrupt the credit facilities of the country in your attempt to gain control and crush these men, they might not have been driven to such desperate measures."

"It was necessary," Claremont defended himself. "They intended to act anyway. You do not seem to understand what they are aiming at. Nothing more nor less than a dictatorship over the world. You might as well abdicate your powers now, unless you are ready to act to the hilt, without regard to so-called constitutional rights. It is a state of war."

There was a murmur of approval from the senators.

"I'm afraid you are right," said the President wearily. "They have gone too far this time."

Within an hour the President issued a ringing proclamation. In view of the actions of certain malefactors and criminals, and by reason of certain unfounded rumors that had spread therefrom, now therefore, by virtue of, etc., etc., he hereby declared the doors of all banks to be closed pending reorganization and the restoration of national confidence; an embargo placed on gold shipments, the nation to be considered off the gold standard; a new national currency to be issued based upon combined bank assets as of June 1st, 1940 (a clever device to retrieve the value of the strangely transformed gold on June 10th), and an exhortation to all law-abiding citizens of the nation to ferret out and capture certain fugitives, to-wit, etc., etc.

The nation reacted to this momentous proclamation in various ways. Solid citizens, whose assets were suddenly frozen by the closing of the banks, roared for blood; the Technocrats' blood. Hanging was too good for them. But the employees of Oil, Coal, Copper and Textiles, having had a close view of the Technocrats and their methods; remembering increased salaries when the other industries were taking substantial cuts, spoke out loyally and vehemently. Not a man of them would betray his chief. The farmers, too, were solidly in opposition; they were rightly auspicious of Claremont and his associated bankers.

As a result, within twenty-four hours, there was chaos. Heated words led to blows, blows to weapons;

armed partisans appeared as if by magic, and riots seethed and billowed resistlessly up and down the nation. Police, troops, were powerless.

In the meantime, the greatest man hunt in history began after the vanished Technocrats. But they were snug and safe in their camoflaged retreat on the Maine Coast.

World's End! Beneath the canopies of seemingly unbroken pine tops the scientists were assembled.

"Haven't we about shot our bolt?" Dr. Meyran, the surgeon, asked. "With the country off the gold standard, further transformations have lost their efficacy. It was a smart stunt on Claremont's part."

Roode shook his head vigorously. "Not smart enough. We've only begun to fight. With gold as a medium of exchange out of the way, the rest of our task is considerably simplified."

"Meaning—"

"That we attack paper next," Roode explained. "Credit, always the life blood of commerce, now stands alone. There is no gold cushion for it to fall back upon. Checks, promissory notes, negotiable instruments of all kinds, mortgages, bonds, stocks, contracts; what are they all but promises to pay, fundamentally based upon the signatures of the men or corporations who do the promising. Remove those signatures, and what is left? Nothing—mere printed phrases without the obligation to back them up. It is nonsense to assume that any one will pay grinding mortgage debts if there remains no evidence that he is legally obligated to do so."

"You have discovered a method of eradicating these signatures?"

"Peasley has. An old, familiar method, but refined so as to be very much more efficacious than the tedious incomplete former methods. But let him tell you about it."

Peasley said modestly:

"It's all very simple," he explained. "The fundamentals have been in use for many years. The average blue or black writing ink is essentially ferrosoferric trioxybenzoate held in extremely fine suspension, or if you will, in plainer language, iron gallate. After writing, and exposure to air, this compound oxidizes to ferric gallate.

"The best of the ink eradicators now in use is a mixture of oxalic acid in dilute solution and powdered tin. It dissolves the ink, and bleaches it out completely. This is well known. My particular contribution is merely to activate the oxalic acid to such a degree that a minute spray of it, reacting with powdered tin, will be sufficient to eradicate every vestige of ink within a hundred foot cube. Printed matter, printing ink being essentially carbon black ground into mineral oil, will of course not be affected."

"But how will you get these unwieldy materials into the banks and use them?" Dr. Meyran protested, slightly bewildered.

Peasley smiled. "The Secret Service was kind enough to help us out by ordering the reduced gold, now tin powder, not to be disturbed. They call it 'clues.' But I must really disclaim all credit. That should go to young Dribble who worked out the plan of operations, and to Van Wyck and McCarthy, who have volunteered to put it into effect. It will be most dangerous, I assure you."

CHAPTER V

The Final Triumph

● The banks were closely guarded. Claremont listened to Dennis' warnings this time. He remembered uneasily that cryptic utterance of Roode's paper—credit paper. Picked United States soldiers guarded the closed banks night and day; trusted guards were stationed within the gloomy vaults, ceaselessly watching untouched gold, stacks of currency, the vast accumulation of paper which on the face of it was worth very considerably more than all the precious metals in the world. Some one had calculated back in 1932 that the then credit structure of the United States alone amounted to the dizzying sum of half a trillion dollars*.

Claremont expressed his utter confidence. Gold wasn't the essential he formerly had believed it to be. The Technocratic industries were safely in his control; the Technocrats run into the ground. True, they hadn't been captured yet, but with the tremendous search that was in progress, it was only a matter of time. At that, it might all turn out for the best. He held all the strands of the web in his hands.

. . . . . .

The pursuit plane, McCarthy at the controls, Van Wyck as observer, nestled out of the night sky on noiseless vanes. It was past midnight and the financial district of the city was deserted. Wall Street was a pool of quietness. The cordon of troops around the granite-walled bank of Claremont did not see the dark shape dropping to the flat roof. There was no jar as it landed.

Very quietly the two men removed a tank of specially activated oxalic acid from the plane, carried it to the center of the structure. Van Wyck produced a long steel pencil with an osmi-iridium tip; it was a cutting tool. The tip glowed into intense heat as he made contact. It bit into the stone and steel understructure as if it were so much butter. Within five minutes a hole six inches square gaped into the interior.

In the meantime McCarthy had rigged up a tube from the tank with a fine spray attachment. The nozzle was inserted into the opening and a powerful pump sent the oxalic contents shooting into the hollow of the building in the form of inconceivably minute particles. Then he set a metal disk into position in the opening, clamping it firmly to the sides.

Van Wyck waited a minute to make sure that the tiny droplets had time to spread through all the bank; then he spoke into the tiny communication disk strapped to his chest. It carried his low tones on a tight beam to Dribble and Silversmith, waiting in the interior of the old brewery.

"We're all set," he said. "Start the juice."

Silversmith threw a switch. Powerful impulses leaped through the intervening ether. They traveled on a focussed beam straight for the flat metal disk inset in the roof of Claremont's bank. The disk, a highly magnetic field, broke up the beam into circling waves of force. These impacted upon all finely divided matter within the area; notably the powdered tin within the vaults, the droplets of oxalic acid permeating the building, the omnipresent dust motes, and of course, atmospheric oxygen and nitrogen.

The impulses, weighted with tremendous electro-posi-

*Stuart Chase, in "A New Deal."

tive and electro-negative charges in rapid alternate oscillation, broke up these fine particles into mutually repelling molecules.†

The whole* process took only a minute. At the end of that period molecules of oxygen, nitrogen, oxalic acid and of tin were everywhere within the bank, even to the innermost recesses of the vaults containing all papers and documents.

Dribble timed the process, and at the end of ninety seconds shut off the waves. The electro-disturbance having been withdrawn, the molecules coalesced into normal conglomerates, and the inevitable chemical reaction occurred between tin and oxalic acid. It fell in impalpable fine spray upon the precious papers, and bleached all ink marks to invisibility. . . .

The guards in the bank first noticed the process in the form of strange drafts of air that quickly grew to hurricane winds. Then came burnings of the throat, followed by rasping gasps as the tin and oxalic acid spewed forth. They quickly donned gas masks—Dorgan had prided himself on that foresight—but the masks proved worse than useless. The charcoal and chemical containers could not filter out molecular tin.

Choking, they blindly stumbled out into the street, giving the alarm.

● McCarthy was already in the plane. Van Wyck shoved the empty tank into the cockpit, hoisted a leg.

"Look out!" McCarthy yelled. Van Wyck, accustomed to quick movements, threw himself sideways and rolled into the plane in a tumbling sprawl. A bullet roared in the night, spat viciously against the side. Someone shouted; there was another shot. At the same time the drumming sound of an airplane motor was heard overhead. A trap had been sprung!

McCarthy grinned widely. Disdaining the use of his helicopters he took off on a short slanting run. He barely missed the coping around the roof, swung upward over the city.

There were many figures on the roof now, shooting a perfect fusillade of shots. They spanged and flattened ineffectively against the armor-plate sides. A great shape dived for them out of the sky, thrumming and hammering with the speed of its flight.

Van Wyck, crouched low at the trips of his guns, murmured admiringly. It was a daring suicidal dive, so close to the roofs of New York. Their own plane was building up speed at terrific acceleration.

The diving plane—Van Wyck saw the familiar emblem of the United States Army gleaming on aluminum hull—levelled off skilfully, and the next instant machine gun bullets beat a rapid tattoo on the racing plane.

"Let them have it," McCarthy yelled, as he pointed the nose upward in a breath-taking zoom.

"Can't," Van Wyck replied, watching the pursuer swerving wildly around to get on their tail again. "That's a U. S. plane. Won't do to kill army aviators; don't want to anyway."

"All right then," McCarthy chuckled. "We'll show them a clean pair of heels."

The ship leaped forward under driving power, leaving their laboring pursuer far in the rear. As they hit ten thousand feet, it was nowhere to be seen.

McCarthy idled her a bit, circling over the city.

"Shall we make a try for the other banks on our program?"

Van Wyck shook his head. "No. They're prepared. They almost got us this time and they're forewarned by now."

McCarthy shrugged. "Okay. We'll pick up Dribble and Silversmith; and then shoot for *World's End* to report."

. . . . . .

Claremont stood with a stunned air inside the great bank. Guards, policemen, Federal men, swarmed in a scurry of confusion. Everything seemed intact; the great vaults were unharmed, unopened; yet every document, every paper, had had all traces of ink removed. They were worthless scraps of paper now; these notes and contracts and bonds that yesterday had represented a market value of almost half a billion dollars.

Clues there were. The powdered tin had somehow disappeared out of the closed vaults; the floors of the bank, the desks, everything, was covered with a fine coating of dust-like powder. Hasty chemical analysis disclosed it to be tin oxalate, and of course its presence explained the eradicating agent used. But how had the tin come out of foot-thick walls; how had tin and oxalic penetrated foot-thick steel? That was an insoluble problem. The consultant scientists shook their heads puzzled, and murmured in awe-struck tones at the wizardry of their outlaw brethren. More than one staid chemist and physicist, respectfully answering Claremont's ejaculated questions, had daring thoughts revolving within his mind. At the first opportunity he would join the scientists, drink humbly at the fountain of such knowledge.

Claremont raged and blustered, his usual poise completely gone. General Perrin, in control of the New York area, listened with impatience. He had been placed in complete charge by the President at the first news of the disaster.

Claremont stopped his fevered pacings, wheeled on him.

"What have you done so far?" he accused. "Nothing, nothing at all! What's the good of the army, of the government itself, if they can't protect the property rights of its citizens? These scoundrels are making a mock of us all."

Perrin held his temper with great effort. His nerves were already rasped by Claremont's recriminations, the clamor for speedy action, and also his professional pride was hurt by these elusive scientists who struck with ease whenever and wherever they wished.

"We're doing all we can," he explained patiently. "We know how they attacked; one of our planes almost got them."

"Almost—" said Claremont with heavy irony.

"The outlaw plane was twice as fast," said the general. "Captain Stearn said they left him standing. We've also found their base of operations in this city; Ribling's brewery. They'll never use that again, even though the birds had flown by the time my men arrived."

"They'll use other bases then," Claremont said

*For example, the molecules of tin, an electro-positive element, finding themselves so to speak in an electro-negative bath, dispersed outward in an effort to neutralize their valences. The immediately ensuing beat of a negative wave thrust them into wild confusion, with the result that the tin powder dissociated into a horde of flying, plunging molecules to which the comparatively coarse interstices of the steel vaults presented no confining boundaries. And a similar process in reverse sent the negative oxalate "radical," the atmospheric gases, into a veritable frenzy of penetrative motion.

gloomily.

"No doubt!"

After that there was nothing more to say. There was silence in the office; each immersed in his own thoughts.

"If only we could locate their real base," said Perrin as if to himself. "Every army, every navy plane, is combing the East. Sooner or later they'll be found."

"And in the meantime," Claremont replied, commencing his leonine pacings again. "Roode has given us twenty-four hours to submit, or he'll go after the other banks." He wheeled on Perrin. "Do you know what that means? We're ruined; the country's ruined." In his egotism the welfare of the country and his own welfare were inextricably interwoven. "Half a billion's gone now; God knows how much damage they can do."

● Again silence.

The door opened quietly. Claremont's secretary came in soft-footed: "A radio for General Perrin," she said. "The Signal Corps operator asked me to bring it in to you."

Perrin took the slip of paper. It was in code. With a side glance at Claremont, he commenced deciphering. The pencil made squeaking sounds on the paper.

He jumped up quickly, his countenance aflame.

"Mr. Claremont," he almost shouted, "we've got them! Here, read this." He thrust his decipherment upon the bewildered banker.

"NX4, Lieut. Winthrop reporting. Have discovered enemy base. Camouflaged by painted canvas. Noted plane entering. Position, Maine Coast, north Bar Harbor, Lat. —, Long. —. Keeping under observation, await orders."

The general literally pulled the great man along.

"Come along; you'll have a chance to see the U. S. Army in action."

The radio fairly sputtered code; telephone and telegraph worked overtime. Within an hour five hundred planes were converging on the doomed base of the scientists; troops hurled northward by fast trains and buses; tanks swung ponderously over rutted roads; the North Atlantic fleet tore under full head of steam along the rocky coast. General Perrin was taking no chances.

Within three hours Perrin, and Claremont who had insisted on being in at the kill, were dropped from a fast plane at the rendezvous, some fifteen miles from the beleaguered base. Already some five thousand troops were awaiting their commander, and more kept pouring in every minute. The sky was a pattern of circling planes, keeping their prey under vigilant watch. The fleet flung out in a wide-spreading net, belching black smoke. Huge gray battleships far out, fearful of the rocky coast, and trim low-slung destroyers steaming close to the line of breakers, tugging at the leash, waiting for the word to go into action.

Perrin surveyed all preparations with justifiable pride. Light field artillery was being unlimbered; preliminary sights taken.

"What do you think of the army now?" he asked with a chuckle.

Claremont witnessed the ordered confusion, the great guns, the disciplined troops with bayonets fixed and trench helmets. It was impressive.

"Let them have it, general," he said viciously.

Perrin looked at him with something of surprise.

"I'm giving them a chance to surrender," he said coldly. "Wheelock!"

An aide-de-camp saluted smartly.

"Take this message to Major Mullan, 3rd Signal Corps. Tell him to send it out at once."

"Yes, general."

Within twenty minutes the ether was full of the message, broadcast on ten different wave lengths.

"Adam Roode and associates! You are ordered to surrender unconditionally within thirty minutes. Unless you reply within that period, we shall proceed to the attack. Hugh Perrin, Major-General, U. S. A."

The nation listened in on its radio sets. Technocracy was at bay, doomed! Portly citizens rubbed their hands in glee; settled back in comfortable chairs to await developments. The result was predestined. These super-criminals, these thorns in the sides of all right-thinking men, were about to be violently removed.

But other men, farmers, workers, the downtrodden, muttered viciously, struggled into coats, left tearful imploring wives at the loudspeakers, dashed out to the general store, the corner café that had taken the place of saloon and speakeasy, meeting house and crossroads. There they met others of similar minds; volunteer speakers harangued vehemently from upturned keg, table top, and platform; men's minds worked into frenzy. The sole hope of a new deal, a way out, for the submerged, was about to be ground into blood and earth.

The Council of Scientists met grimly. They had heard the ominous ultimatum; had been prepared for it hours before. Wollaston, the mathematical genius, had had no difficulty in decoding the messages.

Dribble was almost in tears. It was his rash lone flight in a pursuit plane that had disclosed their whereabouts to the sharp-eyed army aviator.

Roode said kindly: "It made very little difference. Sooner or later they would have smoked us out."

"You are sending an answer, yes?" inquired Chess.

"Of course," Roode snapped. "It's been done."

"And it was—"

"An unconditional 'NO!' Now every one to his post." There was a dull booming sound outside. The first gun had been fired. The men dispersed quietly and speedily. Everyone had a certain definite duty.

● "All right," Perrin nodded, when the message of defiance was brought to him. "They've had their chance."

He gave swift orders. Almost at once the circling planes overhead swung into battle formation, surged forward in long glittering echelons, straight for the enemy base. Each plane was equipped with underslung racks of powerful *dynol* bombs. Ironically enough, *dynol* was Peasley's discovery.

Perrin watched their graceful sweep through field glasses. He dropped them from his eyes; said to Claremont, who was somewhat at a loss in the midst of this martial array: "It will be over in a minute."

The massed planes swept forward, the very embodiment of irresistible force. The foredoomed area lay almost beneath, silent, seemingly deserted. Bombing crews held taut hands on the levers governing the racks.

Suddenly the leading planes were seen to swerve uncontrollably, skim at right angles to their former flight. Squadron after squadron hurled along, swung sharply

(Concluded on page 87)

(Illustration by Paul)

We reached the end of the defile, entering upon a wide space. Near the entrance a number of the plant-creatures stood and tended amazingly complicated keyboards.

MEN OF THE DARK COMET

By FESTUS PRAGNELL

● Our new author from England, Mr. Pragnell, is concerned with the mysteries of space—of time, distance and speed. He tries in this story to make crystal clear, and in a dramatic form, the possibilities of Relativity. And he does it so cleverly that one is not aware of a lecture in his pages.

Naturally many of our readers will take issue with Mr. Pragnell on the scientific possibility of some of his incidents. But one cannot deny that he has written such an unusual story, exciting and charming at once, that minor errors are forgotten in an eagerness to know what is going to happen next.

● When the creatures of the Black Comet passed through our Solar System, and in doing so altered the whole destiny of earth, of Mars, and of every living race, in fact, in our little collection of worlds, it was without any intention of producing such a result. They passed us in the course of their almost perpetual peregrinations, like a tangible patch of darkness, found the globe that lights our little corner of the universe unsuitable for their purposes and went out. Their passing was scarce recorded in any instrument, certainly seen in no telescope, and totally unnoticed by humanity, or would have been but for an extraordinary chance.

It is probable that where they came from will never be known. The educational methods of our strange, transitory visitors, how they were reproduced, and the methods whereby they controlled their numbers—these and many other facts that any student of extra-terrestriology would give his ears to know, will, it is almost certain now, never be revealed.

Heathcote? Heathcote was and is an excellent space captain. No doubt he could write an authoritative textbook on the mechanics of interplanetary flight, how to calculate the best, not necessarily the quickest, route from one planet to another (allowing for the motions of both bodies in their orbits and on their axes, and for the pull of the sun *bending* the path of the vessel, how to find one's objective with a magnetic ray, and how to make use of every available planet to help one).

On these and kindred matters his knowledge is so profound that in almost any emergency he knows what to do without having to stop to think. But question him on anything else, ask his opinion, for example, on the modern tendency for popular governments to lose their power to industrial leaders, or the growing authority of the scientific expert in every field of human endeavor, and he becomes a dull, ignorant man.

It is not surprising that the plant-men, as they have been inaccurately dubbed, found little to interest them in such a man. He must have seemed to them a dumb fellow, void of ideas. We know they tried to interest him in their philosophy, in their science, but he totally failed to respond. Heathcote's account of the adventure is a brief, bald statement of what he saw and what he heard, without evidence of any inquiry into the reasons for things.

And Boddington? Felix Boddington, the only other witness of this strange visitation? Boddington has become a wanderer about the Solar System, a frequenter of odd, out-of-the-way corners of neglected planets. He turns up at the daylit ore mines of Ganymede: he has visited the offices of the Jovian Radium Company on Jupiter where gravity is so fierce that a man can hardly move. He has flitted across the scenes at the Biological Experimental Colony on Venus where a few voluntary exiles labor to produce synthetically, living viruses to destroy specific bacteria that attack human beings, food plants or domestic animals.

Everywhere he arrives, without warning, without explanation, wanders round in his aloof, detached way, then, after asking innumerable questions and giving evasive replies to any addressed to him, before one has got used to his presence he just disappears.

Something of the spirit of the comet people seems to have entered into him. We know that he longed to throw in his lot with them, and only a stern sense of duty called him back to an earth he knew to be in grave danger: perhaps, ever regretting his decision. Dissatisfied with mere humanity, he goes from place to place seeking a race, a form of life, a group of people who will remind him however faintly, of those delicate beings, now unthinkable distances away, with whom his heart really is.

The comet people found much that was congenial in the spirit of this man. Heathcote says that the two men were seldom together, indeed they had little in common, and that he saw Boddington only at intervals. When asked where he had been he merely answered, "Talking to the White Ones," and Heathcote was not the man to press for information.

They must have told Boddington much. It would make any journalist's fortune to secure his complete story; but he is seldom in one place long, a most difficult man to get hold of. A young, inexperienced reporter did run across him once, in the Interplanetary Hostel in the middle of the great Martian desert; but he made poor use of his wonderful opportunity, and Boddington's annoyance on finding the facts he told a supposed fellow-traveler

blazoned about the earth has made the next man's task the more difficult.

However, what the young man, flustered by his amazing luck, found out was sufficient to make his name. Boddington told him the history of the plant-men, and of his own desperate plea for threatened earth, pleadings that had the result of producing a decision totally opposed to the nature of these beings and contrary to the mental habits of millions of years.

He told how the comet people lived on their distant world for eons, till their sun grew red and weak: how they had left behind all passions and struggle with one another, and lived solely to acquire disinterested knowledge; that their birth-rate was mechanically controlled, so that blindly increasing numbers could never set one against another or their race against another race.

They told how they had seen the approach of another sun that must inevitably collide with theirs; but, having thousands of years in which to prepare, how they had planned accordingly. He told how they had reduced their numbers until the moon of their one planet was capable of holding them all: how they had made the moon into a gigantic space-vessel in itself: and how they had wandered, a race without a home, a world without a fixed abode in the cosmos, seeking a place where they might settle down.

And how, in the course of their wanderings, they came upon this system of ours is recorded in these pages.

● The comet registered itself on the captain's instruments long before he could detect it in his telescopes. According to his entries in the log of the space-vessel the thing puzzled him exceedingly. The ship was halfway on its journey from Ganymede to earth, and the instruments ranged before Captain Heathcote as he sat in his pilot-room, measured the distance of the various heavenly bodies by means of the gravitational pull they were exerting, and told their approximate mass and the speed at which they were approaching or receding.

Several times the captain went through the calculations that assured him that his position and course were dead accurate according to the readings of the first three dials, which were trained respectively on the sun, earth and Mars: he repeated the task because he was conscious of a feeling of uncertainty, a dizzyness, a sort of thickening haze in his mind, and the figures repeatedly produced different results.

His trouble is shown by the increasing shakiness of the writing of his occasional notes, ending in a wild slash; but the idea of sending for assistance does not seem to have occurred to him, for, like all strong-willed men, he refused to admit his weakness but kept grimly on.

The fourth dial showed a body about the size of earth's moon, a hundred and fifty thousand miles away and approaching at about two miles a second. At that rate, the captain did not need to make any calculations to know it, less than twenty-four hours would suffice to bring his ship and that body alongside. Yet, turn his telescopes in that direction, use any magnification he chose, and he could see nothing of it; even long exposure photography, with plates sensitive both to infra-red light and to X-rays, was emphatic in denying the presence of the mysterious world. Yet is was not between him and the sun but at a wide angle, and should appear as the moon does when it is not quite half full.

The captain yawned and his attention wandered. He thought of his home, of the wife and child he had not seen for two years: he thought of the cargo he was carrying, several hundred tons of daylight ore—the metal far more valuable than gold, one fifth of one percent of which increases the tensile strength of steel thirty times. He thought of the eleven strange beings who, with five earthmen, manned his ship, unipeds from Mars with oval yellow bodies who for the last ten years had been mining the precious metal on Ganymede, and now, their labors completed, were returning to their native planet by way of earth to finish their short lives in comparative affluence.

They were docile and easily bullied, and privately Heathcote regretted the many brutalities he had seen inflicted by ignorant overseers, and the long periods of toil they suffered for little reward. Sometimes one wondered what went on in those deepseated brains of theirs . . . . . He went on to think of something he had resolutely put out of his mind until now, the mysterious fate that had overtaken the last seven ships to set out from Jupiter's moon on errands similar to his own: just when they had reached approximately this stage in their journeys they had "gone dead," and from there on they drifted, sent out no messages, but behaved exactly as though entirely unmanned, until they crashed into some heavenly body and only fragments from which nothing could be learned were ever recovered.

The captain grunted and sat up in his chair. This dreaming would not do: he must concentrate on this danger that threatened his vessel, and make sure, before the attraction became strong, that he would pass whatever it was at a safe distance. Yet, he felt as though a thick blanket muffled his brain . . . . .

He rubbed his eyes. Before he could work out the best deviation he must clear his head. According to his indicators the oxygen content of the air was correct, and the proportion of carbonic acid gas not too great. Tried as an experiment, extra oxygen brought no relief. A stimulant, that was what he needed: he would send for his Martian servant and demand one of those potent drugs of theirs. He rang the bell that should bring the de-male hopping on his single leg to him. Life on Mars has three sexes, all necessary to reproduction.

The room was unsteady, his instruments showing a tendency to float in front of him. There was something he had to do, something urgent . . . . . Ah, yes, Ganymede had broken loose from its orbit and was chasing him, a celestial game of tag. What he wanted was a stimulant, he would send for one. But he had done that already. In a gust of temper he smashed his fist down on the bell-push, then laughed, drunkenly at himself.

The room was dark, and the picture of his wife and child in its frame on the wall danced a sort of tango. His eyes closed and his head rolled on his arms.

Captain John Heathcote slept.

● Floating in a sort of mist that was somehow filled with vague shapes against which he fought desperately for life, he was conscious of an awful feeling of suffocation, and craved, unavailingly for air, air, air at any

cost. And all the while he struggled there was, driving him to further efforts, a sense of an impending catastrophe, a catastrophe far more terrible than death, which he must avert, but knew not how. It was as though some holy mission he was entrusted with was in danger of being lost; but just as he was about to grasp the details, to remember the secret that would make everything clear, solve the mystery of life, it faded away from him . . . . . For days and weeks, he thought, he struggled thus; then, finding the walls of his control-room clear around him, he tried to collect his faculties, only to sink into the world of dreams again. Racking pains shot through his head. All the while he sank deeper and deeper into a suffocating fog.

He would struggle upwards to full consciousness, then his agony would multiply, and he would sink back again. In one of these spells he realized that his body floated, weightless, in the air; that showed that the space-ship was no longer answering to the magnetic ray but was drifting. At last he managed to drag himself to the instrument table. His watch had stopped, but he knew without that, that many hours had passed since he had been overpowered. A faint smell as of rotten oranges was in the air: he recognized this and the pains in his head and limbs as the after-effects of poisoning by the Martian drug, *borga*, the narcotic that is the curse of the planet, a small dose of which is fatal to an earthman.

All that time no one had come near him. The implications of that fact he could not bear to think of just yet, it would have to wait. By a process beyond reason the captain knew what had happened: the Martians had brought a supply of their forbidden drug aboard, and it had broken loose and dispersed itself throughout the ship, killing every occupant but himself. What had nearly finished him must necessarily have slain every one else: his little, wiry frame had remarkable powers of resisting poison, even the comparatively harmless earth drugs showed that. Though a temperate man he could drink, and had drunk, without signs of distress, quantities of wines and spirits that rendered habitually heavy drinkers totally incapable.

Besides this there was something else that told Captain Heathcote that he was alone in a ship of the dead: he thought it was instinct, but had any one else been there they would also have known. Not all the messages our senses bring to our brains find their way to the conscious mind: our ears, for instance, bring us many unacknowledged messages. Ordinarily, as the captain sat in his room, a man would cough in a nearby cabin, a step sound in the passage, or paper rustle somewhere. Some of the passengers even slept audibly: but now was silence, a silence to terrify the strongest nerved man.

Staring into the vision plate that showed the view ahead he saw that, uncontrolled, the ship had taken on a steady spinning motion, and the stars, colored points set in velvety blackness, seemed to circle round the vessel. In one place there was a round space that held no stars, a black hole in the sky. For several minutes he stared at this before his poisoned brain found the explanation: that black object must be the menacing body his instruments had warned him of, and its apparent invisibility due to the total absence of light reflected from its surface. Even now it was rushing at him at several miles a second: it seemed strangely unimportant, a trivial matter.

Gradually he was working off the effects of the poison. Possibly there might be, somewhere in the vessel, some person or persons not quite dead who might be revived. Plainly, his duty was to save the ship then make a search and ascertain if this were so.

A ticklish task. The spin of the vessel handicapped him and most of the apparatus refused to respond to his touch. Hours would pass before the magnetic rays could be focused on their distant objectives: that left him only the rocket tubes, whose powers were limited, to work with. But even the tubes seemed to be out of action.

Realizing at last that it was hopeless to attempt to put matters right from the control-room, he hunted out his magnetic shoes, buckled them and stepped out into the corridor. Hardened as he was, he could not resist a shudder at what he saw there: before him, floating in the air were the bodies of two of his men, one of them sitting on nothing, the other apparently in the act of making a tiger-like spring, the attitudes in which the poison had caught them. Already their faces were marked with the green tinge that would presently cover them from head to foot.

"Is nobody left alive?" he groaned, aloud.

"How do, Cap!"

Turning sharply, he saw a tall, gaunt man regarding him with a faint smile. At once the captain recognized the wasted frame of Felix Boddington, the prisoner, who, two years before, had been convicted of ruining his own constitution by indulgence in the Oriental drugs, opium and cocaine. Since he had refused to cease these practices and as medical evidence left no doubt that, allowed to continue them, the man would soon be dead. he had been sentenced to Ganymede, to be detained there for a while. It was hoped he would be unable to obtain the drugs, and that what was in his system would have time to work itself out.

It chanced that he traveled both ways in the same vessel, the *Aristotle*, of which Heathcote was commander, and the captain remembered Boddington as he saw him when he first boarded the vessel, a man who, in spite of the terrible state of wreck he was in, had obviously once possessed considerable physical and mental powers.

"I must have excitement, captain," Boddington had explained, smiling his little smile that showed no trace of repentance for his crimes. "This monotonous world bores me to death." Heathcote had personally superintended the searching of the prisoner's luggage, and had destroyed several packages cunningly hidden therein; at which Boddington had smiled once more.

To be alone in space with such a man, thought Heathcote, with a mental groan. Nevertheless he had to admit the other had improved in health and weight, and his sunken, ghostly white cheeks now showed traces of color. Probably, and this was a bitter thought, the very fact that the man's saturated system had become inured to powerful drugs had enabled him to avoid the fate that had overtaken so many better men.

"How do, Boddington!" responded Heathcote, sharply.

The cold, hard tone did not abash the prisoner. "Has a hitch occurred in the chief warden's ordering of my compulsory health vacation?" he enquired.

Heathcote smiled. He would not let this fellow see

that the sly attack had annoyed him. "No," he replied, with heavy sarcasm, "the matter has been arranged for your amusement, to give you the excitement you asked for."

"Then it must be written down as a failure," said Boddington; "I am not even interested."

CHAPTER II
The Landing

● Now Heathcote was really annoyed and showed it.

"Whether the deaths of brave and capable men interest you or not," he said, "you will assist me in endeavoring to save the ship. Your own life depends on it perhaps in that you will be interested. In spite of the most stringent precautions a supply of *borga* has been smuggled aboard the ship: the poison has spread itself in some way throughout the vessel. Whoever it was, his carelessness has had the most disastrous results. I admit it is probable that one of the Martians was responsible for introducing the poison, but don't forget that you yourself will be under suspicion until the matter is cleared up."

"It is true I have tried this *borga*," admitted the other. "As a substitute for opium it has its merits, but the resulting lethargy is unbearable. If I had not I should not have known of the existence of an antidote, or had any with me to inject myself with when I found the familiar symptoms coming on."

"And you made no effort to save any one else?"

"Somebody stole my supply three days ago, in fact I had so little left that I was unconscious for quite a while."

Heathcote sighed. The position was bad, and it seemed that he would have to rely on himself alone: no useful assistance could be looked for from this fellow.

"That," he said, in a tone he tried to make grim, "will be a matter for inquiry when the causes of the accident are investigated—that is, if we ever get back," he added, his weakness suddenly asserting itself.

"Accident," queried the tall man, looking down on him with an air of gentle reproach, "is it possible that a man of your experience should think this an accident? But I forget, you are a sick man: it is wonderful that you are still alive."

"What do you mean?"

"Heathcote, consider the quantity of *borga* there must have been, coupled with the fact that my antidote was stolen. Further, how could the poison spread itself so thoroughly through the ship and so quickly It must have been deliberately introduced into the ventilating machinery."

"That is true. But who would do that and accomplish his own destruction?" For a moment Heathcote wondered if Boddington were the guilty party.

"Come, come, who would you expect to use *borga!* What planet produces it, uses it continually? Have I not told you the Martians have an antidote they can inject into their veins? There are no Martian bodies on the ship I have been to their quarters, everywhere where they are likely to be found, but not one is to be seen, dead or alive.

"What earthman ever understood the subtle workings of a Martian mind? I have come nearer to it myself than almost any other man: they work for their ends by devious routes, generations are not too long for them to wait if they see a chance of attaining their objects in the end. Knowing this I have often wandered when the next act in the cosmic drama of Mars' subjection to the earth was due to commence, though I confess I was as surprised as any one else at this precipitate attack."

"I can't believe it of them, always so docile and willing. Why should they want to destroy this ship? For the sake of the cargo? But even if they transferred the ore to the small emergency sphere, easy enough to do while it is weightless, it would be no use to them: the arrival of every space-boat on earth or Mars is reported, its history recorded and its cargo searched. Otherwise, heaven knows what carnivorous plant or deadly insect might not obtain a hold on the inner planets."

Boddington raised his eyebrows. "Really, Heathcote, must I explain every self-evident point to you as though to a child? I grant your silly debating point. The emergency flier is gone, the power-room is an inferno of red-hot metal and escaping power. It would be impossible for the Martians to land their stolen cargo secretly on Mars unless they had the assistance of the native authorities. Tell me, what is daylight ore used for?"

"Ultra-steel is made with it for bridges, roads, and such-like."

"Anything else? What are we in now?"

"Also for airplanes and space-ships, of course."

"I think we may say the ore is used mainly for space ships. How many loads have so far been actually landed on the earth?"

"No full loads, and only four small ones."

"And how many have gone astray, as we have gone astray?"

"At least seven besides ourselves."

"Well, those are the facts. Do they suggest any conclusion to you?"

The space captain did not answer. His brain was vibrating to the one word, "War," so loudly that it seemed the dead men and the escaping pirates must both hear. The only conceivable object of obtaining such large supplies of daylit ore secretly was the construction of a huge space fleet, a fleet against which earth, with her handful of vessels, would be helpless. It was utter extinction in a sudden attack that faced humanity: then Mars, her servitude over, would rule the planets.

"And we can do nothing to warn our people," he murmured, barely audible, at last.

● "That so," drawled Boddington, raising thin eyebrows beneath which his eyes seemed to have sunk into his head. "I take it we are drifting towards the earth, and that when we are near enough some ship will be sent out to rescue us."

Heathcote gasped. He had been made to feel a fool, but the ignorance of space-navigation now revealed restored his self-esteem. This simple optimism struck him as being irresistibly funny: he smiled, a smile that grew into wild, hysterical laughter. With studied patience, Boddington waited.

"Our present direction," explained Heathcote, at last, "will not bring us within ten million miles of earth, for we left the plane of the planets in order to pass over the asteroidal belt. If, as you say, the power machinery is wrecked we have no means of producing

the magnetic ray which alone will bring us back to safety, or of informing anybody of our plight: unaided, the rocket tubes are capable of little more than ensuring a safe landing when a planet is reached. Besides, we are at this moment, I had forgotten it, rushing headlong into collision with a body that can only be a comet. Look!"

The spinning motion of the ship, probably due to the escaping power, had perceptibly increased: the sun and the distant stars, among which Mars was greenly conspicuous, appeared to be whirling round them at a speed to make one dizzy. Boddington now understood why they had drifted while they talked to one of the walls of the passage. He tried standing on the wall and found it a success. But he could see no comet.

"See there," explained Heathcote, "a round space where there are no stars: that is it. It absorbs all the light that falls on it, so that it can only be picked out by the hiding of the bodies behind it."

Difficult indeed was it to believe that that sphere was matter and not absolute nothingness, a hole in space: it looked more like the blackness of ultimate Nirvana whirling round them, the end of all things, a place where nothing existed.

With a curt direction Heathcote led the way to the steering-room where the rockets could be operated by hand when necessary: on the way a quick glance showed that the power-rooms were unapproachable, and a horrible smell of burning flesh came to their nostrils.

Trying the levers and switches, the captain found everything apparently in order. "Must correct this spin first," he muttered.

Boddington, unprepared, staggered at the sudden application of force. The stars circled more slowly, the comet seeming like a black panther creeping stealthily round and preparing for a spring.

Boddington staggered to the left and assumed, correctly, that their nose had been turned to the right. He had time to wonder whether this would result in their turning end over end like a boomerang, then he thought that the comet itself stretched out a great hand and arm and pushed them away. He crashed onto the ceiling, which was now the floor. Getting up he called to Heathcote, seated in the swivel-chair with feet above his head, "Why decrease our speed, Cap?"

"So as to be caught by its gravity and find an orbit round it."

"Why? I've already seen all I want to of it."

"Fool," Heathcote called down to him in his deep voice, "don't you find the place already getting uncomfortably hot? In twelve more hours parts of the vessel will be incandescent, and if the rocket fuel does not explode the envelope will burst anyway, and our air escape into space. A landing on the dark comet is our only hope."

"Cheerful prospect," returned Boddington.

They traveled in an elliptical path round the Black Comet, being about ten miles above it at the nearest point. Even so close as that, they could see nothing of its surface, but seemed to be looking down a bottomless well in space; this in spite of the fact that they were on the sunward side and not in the pitch darkness that enveloped them when in the shadow of the comet. There was an illusory feeling that it radiated intense cold as well as darkness, though here and there were glowing spots of red.

As Heathcote cut down the speed they sank closer: there was no atmosphere, so that atmospheric breaking could not be used, and they had to rely entirely on the rockets. At last they touched the surface in their passage: there was a rending sound as of the tearing of a sheet of tinned iron, and the compartment was momentarily bathed in bright red light. It happened again: wherever they touched appeared a blazing red spot.

"I'm going to land," called Heathcote, applying all his braking power. The heavens wheeled drunkenly, and the rush of blood in Boddington's head gave him a violent feeling of nausea.

They dropped like a stone until Heathcote discharged rockets downwards to check the fall. Where the blasts struck, the ground at once burst into fire: then they saw that it was simply a long crack that had formed, through which the red light glowed. A transverse crack appeared, at right angles to the first: they seemed to be plunging straight into flames: then they touched; again that sound as of tearing tin; they had broken through.

● It was a change as sudden and complete as though they passed from one dimension to another, or as if they had gone from a region of snow and ice to a warm, well-lighted room. Space was bathed in red light, and they knew, without testing it, that it was also charged with radiant heat. Below was air in which floated little fleecy clouds: while above, the inner surface of the envelope through which they had plunged, formed so perfect a mirror that it reflected the scene below, far above their heads. Some details that were vague when one looked down became clear when one looked up.

"Captain," observed Boddington, "your efforts to amuse me are becoming more successful: I am mildly interested."

A gust of regret filled Heathcote that this fellow should be his sole companion, and not some understandable member of his crew. As he thought of them, straightforward and willing, without the perplexing subtleties of this man he was saddled with, a momentary impulse to murder flashed through his brain.

Steadily the vessel dropped towards an area of black water, dipped below, then came up and floated. With the deafening crackling of the redhot metal came clouds of steam that obscured everything from view, so that it was many minutes before they were able to see clearly.

"We are lucky," said Heathcote, after making tests, "the air here is thin but the oxygen content is O. K., and there is nothing harmful in it."

Without reply Boddington opened a door and went out onto the outside encircling platform. Momentarily annoyed that he had not asked permission to leave the ship, Heathcote followed and went the other way. He saw that the vessel rocked on a gentle swell, and felt a fresh breeze strike his face. Using his pocket compass he found that the wind blew from the east, for this world, which could not have any geographical

variations of climate, yet had a North Pole to which the magnetic needle readily responded.

Then he took out the intricate little mechanism that all space navigators carry which shows the direction and approximate distance of the sun. His reading showed that they were leaving the Solar System at such a startling rate that he concluded the instrument had gone wrong.

How could there be winds here, seeing that there was no external source of heat to cause them? High above sailed an egg-shaped pink object, having seen one of which he began to pick out others. They might be birds, or some new form of flying life, or then again they might be ships.

With a grunt he gave it up and went inside. From a crack somewhere in the envelope water trickled in. Awaking to the danger of this, he started an atomic blast to send the ship onto a sandy beach a few miles off, careless of whether he was causing Boddington to fall off and get a soaking. He managed neatly, a downward blast at the last moment lifting her so that she came to rest with her fore parts clear of the water and the power-rooms in sufficient depth to ensure that they would not heat up dangerously again.

For a while he examined the machinery to see what chance there was of effecting repairs, but most of it was still too hot to handle. Then he became uneasy about Boddington. A rapid search did not reveal him: probably he had gone exploring, again without permission; or perhaps he was having a good feed somewhere, or looking for more *borga* or opium.

That reminded Heathcote that he was hungry, and he got himself a good meal. An unaccountable feeling that he was being watched by many eyes was growing on him: once, convinced that some one or something was between him and the door, he swung around suddenly and said, "Hello."

Once he jumped up and walked to the window, but the landscape was bare except that it was dotted with low mounds he had not noticed before, which, by reason of their exact roundness, he thought must be either plants or the structures of living things such as ants.

Making an effort, he went on with his meal. The air was growing misty, and through a thick fog that that had sprung up outside and was drifting in the honest white light of his own lamp, which he had working again, shone murkily. Although he shut out all air but that coming directly from the ventilators the fog still grew thicker. Perhaps it was some chemical effect due to the meeting of earthly air with that of this place. Unreasonably, treacherously, his light went abruptly out, leaving him in a pale red gloom. He heard a squeak that he knew was from some creature not of earth, then complete, unexplained blackness enveloped everything.

CHAPTER III

Prisoners

He was conscious of being lifted, carried, of being unable to resist. Then for a while he knew nothing. "This is getting monotonous."

It was Boddington's voice in the darkness, Boddington expressing his reactions on finding himself drugged into insensibility for the second time in little over a day. Boddington was right, it was getting monotonous. Heathcote found himself lying on something soft in a place that was perfectly dark and silent.

He sat up, and instantly a white light, dazzling at first, snapped into being. He lay on a heap of brown, feathery material in a circular, domed room that seemed to be the interior of one of the mounds he had seen: it was about twenty feet across. The tall figure of Boddington lay on another such pile not far away. The wall was mainly red, but other colors were splashed about it in haphazard streaks and spots: it jarred on his sense of orderliness, but it did not occur to him that it might have been done by creatures able to see only red and infra-red light, and consequently blind to the imperfections of the wall.

Between the two men what Heathcote took for an ornamental plant grew out of half a red ball that stood, flat side uppermost, on the floor. It was of the dead white of bleached bones, and rather at first glance like a tree, five foot tall and without leaves. Two branches, growing near the base of the trunk, ended in suction pads ringed with hooks: higher up two more branches divided and sub-divided until they became thousands of minute points; while the only other branches were three short ones at the top that looked to Heathcote as though they had been severed, leaving raw round ends of pink flesh.

"Morning, Cap," exclaimed Boddington, cheerfully, "what do you think of our host?"

"Host?" returned Heathcote, "I see nothing."

"Right in front of you, on the red hemisphere."

"That? That's only a plant."

"No, it's a form of animal life, it keeps moving, every tendril quivers, and those short limbs are eyes, it keeps turning them from me to you."

Looking more closely at the white plant, Heathcote saw that it was true: every limb of the strange plant, or creature, was in constant motion. As he watched, the bowl moved, he thought it had overbalanced, but it glided up to him and seemed watching him intently. His curiosity aroused, he decided to examine it, but when he rose it glided away.

Hearing Boddington chuckle, and becoming suddenly, in some queer way, afraid of this thing, he strove to hide his feelings in a burst of temper; but it easily avoided his hasty efforts to catch it, and sliding rapidly along, always upright, shot through an opening where a section of the wall rolled up like a parchment to let it out. When Heathcote reached the spot the wall was as solid as a rock to his hands and feet. It was immovable.

On the way he nearly fell over a number of objects in the center of the room. There was a square table hanging by whitish cords from the ceiling, and two chairs, obviously brought from the *Aristotle*. On the table was Heathcote's interrupted meal, exactly as he had left it except that it was cold; while another table bore a similar selection of foodstuffs from the ship's store. Seeing the refreshments Boddington sat down and began, in a perfectly natural manner, to eat and drink: Heathcote, after some hesitation, joined him, and fed himself with as much dignity as possible in view of the fact that the other had taken possession of the only available knife and fork.

"What do you think of our hosts now?" queried Boddington, still cheerful.

"Must be a low form of life," growled the other, "No brain so far as I can see."

"On the contrary, I consider it a very high form of life. Why must you conclude, because our brains are concentrated in one spot, every intelligent being must be the same? Could not an equally efficient mind be associated with several smaller brains, or even with gray matter, or something akin to it, distributed throughout the body?

"Hands are more fundamental than brains. Without hands our brains would be of little use. I ascribe the rise of humanity as much to the development and use of limbs efficient at handling things as to the increasing size of the brain. How can you look at the wonderful handling mechanism of that creature, those hundreds of fine fibers and suckers, with those two lower limbs for use when force is required, without realizing that they must be capable of a thousand delicate operations our clumsy fingers could never accomplish?"

"Maybe," answered Heathcote, rather out of his depth. As he spoke he saw that the object of their discussion had returned, and he jumped up to pursue it again.

"Let the thing alone," barked Boddington, "can't you see it may be useful to us? Chasing it away whenever it appears. Let me see if I can talk to it."

Taking his plate, knife and fork from the table, he waved them in the air before the plant making several gestures. It seemed to consider, then turned and went away.

"See," he said, "it understands: I indicated that we wanted more knives and plates and forks and it has gone to fetch them."

"Hmph," grunted Heathcote incredulously, "if you think that thing knows what you meant you're mistaken." But he had to admit himself wrong a few minutes later, when the plant glided in again, carrying the required implements in its delicate tendrils.

"Not bad, eh? We're making progress. What can we tell him next?"

But it was the plant itself that took the next steps in communication: it glided up to them, then away, as though asking them to follow. When Boddington did so it led him to a round black pillar near the wall, in the side of which pillar was a handle which the plant, apparently demonstrating how it worked, pulled out and pushed in again: trying it himself he found the top of the pillar grow radiant with heat which increased as he pulled the handle further out.

The purpose of it was shown by several frying-pans, saucepans and kettles from the *Aristotle* which lay near on the floor: the comet people had provided them with cooking facilities. Going on, the plant showed him simple but common-sense sanitary arrangements, and two pipes, one of which gave forth a soapy fluid and the other drinking-water when squeezed. He tried washing his hands and face and found it a success: there was no towel but the plant showed him how to switch on a radiant heat that dried him in a few seconds.

Encouraged by success, Boddington made further experiments. Wetting one finger, he drew the outline of a tea-pot on the wall. The plant looked, considered, and went, to return shortly carrying two of the articles indicated together with a pointed metal stick and a black board.

"Pencil and paper," thought Boddington, grasping them eagerly but he could make no mark on the smooth surface. The plant had a little difficulty in showing him how to start the current that left glowing red marks where the board was touched; the application of heat wiped it clean again. Thereafter interplanetary communication proceeded on more satisfactory lines.

● For several days the two men found all their needs attended to except those of exercise and intellectual companionship. Well-meant efforts at conversation served only to point out their differences, to establish their lack of a common field of interest, and both became bitter and taciturn. Time hung heavily, for the difficulties of explaining to the plant-animals, they could soon distinguish individuals, that they needed a pack of cards or a chess board proved insurmountable. Boddington did succeed in obtaining a razor, and kept himself neat and tidy: Heathcote, with a vague idea of being different, began to cultivate a beard.

As far as possible they kept apart, rather like the two men in the Bab Ballad who, ship wrecked on an uninhabited island, would not speak because they had not been introduced. Each endeavored to sleep while the other was awake. After an indefinite period of this boorishness three of the plants slid in together and succeeded in conveying to them that something important was about to happen.

Presently there entered two more of their kind pushing before them two chairs that had been mounted on red hemispheres similar to their own. This queer mingling of earthly and unearthly objects was the first indication that the hemispheres were not part of the plants, but merely a means of locomotion. On the backs of the chairs was what looked like a twentieth-century radio set, bearing a mass of wires shaped to fit over a man's head, on the inner side of which shone a myriad points of naked metal.

Perceiving that the creatures wished him to sit on one of the chairs, Boddington, philosophically accepting his helplessness, did so, and felt the cap placed over his head. Heathcote hung back viewing everything with suspicion.

Probably thinking he did not understand, two of them took hold of his legs in their lower limbs to lead him to it. Indignantly, he wrenched his feet away. It was Heathcote's second attempt to use force on the Black Comet, and it was no more successful than the first: his wrists and ankles were promptly seized by four of them. His legs swept from under him, he fell on his back. He fell heavily, shaken, but the soft floor and the light gravity prevented him from being really hurt. It was Boddington's smile that annoyed him most.

Now it is possible to tell part of the story as Boddington saw it, thanks to the young reporter who got the details from him: It is even possible to use Boddington's own words, except that the young man may possibly have embellished them a trifle in his own professional interests.

For sime time, says Boddington, I had been conscious of the efforts of these beings to get into closer touch with me. I felt a dumb, as yet expressionless, but powerful striving of an alien intellect seeking, in spite of absymal differences in methods of thought, in the chemical bases of life, in spite, even, of a different set of senses, to find some common ground with my own. The feeling invaded my waking hours, disturbed my sleep, as though determined efforts were being made to reach me by telepathy.

The effort failed because my mind could only conceive ideas that were familiar, and the thoughts that were being conveyed to me were those of an alien world. There was an insistence on colors: the plant-creatures seem to see seven primary colors, but they are to us either red or invisible infra-red rays, and their color sensations are totally different from ours.

These thought waves, and they were strong enough to fill my mind with a sense of uneasiness, of frustration, succeeded in conveying only one concrete idea to me: that there were beautiful, instructive pictures on the walls of our cell. But when I looked I could see only a red surface badly disfigured with yellow.

Had it been left to Heathcote we should never have become *en rapport* with these beings; we should have gone on hurtling away from our planetary system, dumb prisoners, studied as zoological specimens are studied. Men like Heathcote, I suppose, are necessary, but they make poor company, and they are useless in a situation like this one. It was soon obvious that I should have to depend entirely on myself; no useful assistance could be expected from this fellow.

● I blinked to find myself in the red light again, There is much monotony about a landscape bathed in an entirely red light, and after a time it is very fatiguing to the eyes. One closes them and sees it all again in blue and violet. Yet, to our guides it was a beautiful world with all the shadings and blendings that must result with no fewer than seven primary colors. After all, colors are merely an invention of the brain, they do not exist apart from the eye that beholds them.

The mounds were irregularly scattered about: there was none of that geometry of design and planning that makes human buildings so painful to the eye. That mania for straight lines and right angles was non-existent here. Bulbous vegetation, jet black to my alien eyes, grew here and there, and our guides carefully avoided it. On tall, wavy, tapering stems pear-shaped lamps gave forth red radiance: there were dark hills in the distance, and fleecy red clouds in the sky.

We slid on, through the mounds which I saw were habitations, uphill and down, always at the same unhurried pace, and noiseless save for a certain dry sliding sound and the occasional crunching of some small object like a sea-shell. Passing through the mound-like houses, we came upon an expanse of rows, straight lines at last, of vegetation similar to that which decorated the town, except that it was smaller, more hairy and hardy-looking. These, I realized must be cultivated fields used for food production. Besides the ordinary red lamps there now appeared many more of different design and dark; probably producing mito-genetic rays for the promotion of growth.

Farther on the cultivated plants became bigger, then we came upon an oval red object, twenty feet long, that rolled along the rows, cutting off every plant near the ground and throwing it into a huge basket at its back. This work was performed by a sinuous red arm that divided into hundreds of branches, each seemingly endowed with intelligent life, that grew out of the front of the machine. How it remained in front, instead of being rolled on in the passage of the sausage-shaped object, I was not close enough to see. As the machine passed it sprayed the ground behind with what I guessed to be a fertilizing fluid.

A pink moss had sprung up on the cleared ground, covering the space between the severed stumps. Farther on the stumps began to sprout again, smothering the moss out of existence; while, less than a mile away, another machine was cutting them to the ground again. Suddenly I realized the amazing speed at which the whole process was being carried on: where the machine had been a moment before the soil was hidden under a pink carpet: watching one stump I actually saw a fresh shoot appear and grow several inches.

My brain reeled as I tried to calculate how many of these beings in whose hands we were could be supported by this one farm, which stretched from horizon to horizon in bands of about half a mile. Surely little nourishment was needed to feed one of these flimsy beings.

After traveling several more miles we came upon a smooth, glassy road leading into the hills. Entering a long ravine, lit only by lamps at wide intervals at the bottom, and by the diffused radiance from that perfect mirror a hundred miles above our heads, we saw flying creatures flutter past, but so fatigued were my eyes that I could not determine their shapes.

"Red, red," I heard Heathcote groan, "if I don't soon see some other color I shall go blind or mad."

Again I felt that sense of questing in my mind, that uneasy feeling of searching, of grasping at something intangible. It was stronger than before, and accompanied by a feeling of nearing success, as though something sought were almost within reach, and would soon be attained. Instinctively, against my reason, I resisted: it was like trying to keep the telepathic fingers of an alien mind out of the innermost sanctuaries of my brain.

I felt that, once let this foreign thought penetrate to mine and all my most secret self would be known, all my personal desires and wishes, hidden memories of by-gone wrongful acts, thoughts and ideas I would not admit even to myself would be exposed. We are all prudes, with minds full of inhibitions and complexes. Nevertheless I knew my resistance would avail nothing.

An order rang out, a telepathic command, "Halt!" so clear that I was not in the least surprised when the whole procession came to a sudden stop. Then there were further commands whose meaning eluded me.

Thinking to stretch my legs I tried to jump down from the chair. But my apparent freedom proved illusive, I could not do so. Two of the comet-men approached, carrying a black object like a sausage wrapped in a handkerchief. "I am to be blindfolded," I thought, and so it proved, for they clapped this over my eyes.

Opening my eyes, I found them inclosed in a sort

of box containing a brightly colored kaleidoscopic picture. Before me was a landscape bathed in sunlight assisted by occasional white lamps: to right and left the ground sloped sharply upwards, being covered with rich green grass among which grew flowers similar to pansies, tulips, crocuses and big blue cowslips, as well as a varied confusion of shrubs.

The sky above was a clear blue with no sign of clouds; while, in the foreground of the picture was a group of plant-creatures different from any I had seen. The hemispheres on which they were mounted were of different shades; one yellow, one orange, one purple, one violet, and on them were pictures of short-winged, long-legged birds and of beautiful things rather like butterflies. The comet-creatures themselves were beautiful in violet, red, blue and yellow, these shades continually varying, moving rhythmically up from their bases. I marvelled greatly at the perfection of the picture, especially as the plant-beings were all moving, and birds and insects similar to those shown on their strange vehicles fluttered about them. It was, I realized, an attempt to show me what their world would look like in a white light.

CHAPTER IV

Two Light Years Away

● Turning my head, I saw Heathcote beside me, staring at me in astonishment. His clothes were soot-black, he wore green binoculars, and his skin was as white as a clean shirt, a veritable man of chalk. The amazing explanation of this occurred to me suddenly: I was looking not at a picture enclosed in a box but at the actual scene before me.

In some strange manner the substance through which I was looking shortened the light-waves, bringing the normally invisible infra-red rays within the narrow limits of our visible spectrum; so that we were seeing this world more nearly as the inhabitants saw it, except that we could never know how these sights were actually recorded in their brains.

This was a beautiful world, more beautiful than any spot I had known on earth, yet the limitations of our senses had blinded us to the fact. I wondered what we would find, supposing our ears and noses were similarly attuned. Delightful perfumes, ethereal music, I am sure, would have greeted our educated senses. And I might have reached that stage, have become part of a world of ultimate perfection, where every animate or inanimate thing had been made to minister to the dominant beings, to provide delights for the senses, and where was no pain or trouble, nothing but the steady acquirement of knowledge and then enjoyment of beauty more keen than the transient delights of any drug.

But I cast aside the opportunity, turned my back on this world and its gentle inhabitants, to save a planet of my fellow men, who treated me as a felon because I sought beauty in a way they did not approve, who sent me to exile because of the way I treated my own body.

But I digress. We still had some distance to go on those gliding half-balls, the bottoms of which were so perfectly smooth that the road might have been thickly coated with oil; and it was with deep regret that I realized that our journey was done as we reached the end of the defile, entering upon a wide space with a smooth, glassy floor. Near the entrance a number of the planet-creatures stood beside their hemispheres and tended amazingly complicated keyboards, every one of their hundreds of fine tendrils plugging in and unplugging, making and breaking connections, moving tiny wheels, handles and levers.

I realized the bewildering intricacy of machinery made and operated by beings specially evolved for its use. It filled me with revulsion for the clumsy mechanisms of earth, where man surrounds himself with ugliness.

We slid on into the center of the space, where our guides reached out their strong lower limbs and dropped to the ground. Our chairs, with us still unable to leave them, were taken off and stood on the floor. On a flat yellow stone before us three of the plant-creatures stood with their many fingers intertwined in the wires of an intricate machine.

Thus we sat while they stood and waited. There was no movement save for things that occasionally flew past, others that, never in a hurry, walked amongst us, and the incessant vibration of the tendrils that were the fingers of our captors. There was no sound save the flap of tiny wings or the soft pad of little feet.

Peculiar sensations assailed me. I felt my legs grow burning hot, then cold; but when I looked there was nothing there. I felt a slap on the chest, again from no visible cause. There was a sweet taste in my mouth, followed by a sharp one. I heard a series of musical notes, traversing the whole range of hearing: I smelled peculiar smells and saw various lights.

All these sensations had their origin in impulses from the cap over my head affecting my nerves, and I realized that my senses were being experimented with to determine how I responded to different stimuli. Suddenly I felt as though a red-hot needle were plunged into my spinal column: the muscles of my arms contracted violently. There was a vague stir, and I had a distinct impression that these beings were apologizing because the impulse had been accidentally made too strong.

A soft, low voice said, "It is done. We can talk to you." The voice was not in my ears but in my brain.

I was not surprised. So long had I felt those voices in my brain, trying to express themselves, that when at last they became articulate it was as a thing long expected and waited for. I knew I had but to think my answer and it would be understood; but I remained passive, awaiting more.

Heathcote spoke, aloud. He demanded that we be returned to our own ship and sent back to our own planet. At once a flood of answering reasoning poured into my mind, arguing, pleading. We were welcome on this comet, where not only would no harm come to us, but every arrangement would be made for our comfort: this was the place of happiness. Heathcote would have none of it; all he wanted was to get back to his own people, and I must come with him. His speech became so rapid that they protested they could not follow.

I interrupted the argument, speaking aloud so that Heathcote might hear. I had no desire to accompany my compatriot, but would be delighted to accept the

hospitality of the people of the comet. That brought his wrath on my own head: he cursed me, abused me, reminding me of what in truth I had forgotten, the danger that threatened our people at home.

"We must consider this matter, and sleep and rest before we decide," I told them.

"What is this sleep?" they asked, their attention now wholly on me. I explained our days and nights, and how we were active during the day and slept during the night. Their world, they said, was always light, and having no necessity for periods of violent activity to be compensated for by periods of recuperation, they were always tranquilly conscious. Haste was an unknown thing on the Black Comet.

Nothing more passed between us. We were lifted back on the flat surfaces of the hemispheres, the guards remounted, and away we went, through the plantations of swiftly growing plants, now a riot of brilliant hues, past the harvesting machines that rolled over the fields but never became soiled, to the low mound that was our home, or prison, on this world. Our guards took the light transformers away.

● Heathcote began at once to talk about the urgent need of getting back to earth. His insistence irritated me, for I wished to dream about the plant-beings, and all I might learn about them when our method of communication, at present crude and requiring concentration, was perfected.

"How do your propose to get back?" I asked wearily.

"Our ship can be repaired and we can run it between us. If I show them how it works these beings can put it right in no time."

I realized that the man had energy of a sort that often gets its own way. "How far away are we now?" I queried.

He glanced at the watch-like instrument on his wrist. Using the shortest known rays of the sun, harder, that is, more penetrating, than even the gamma rays of radium, it always indicated the distance of that body.

"The thing is broken," he said, "either that or we are more than a light-year distant. Which is impossible."

Is anything impossible? For my part I had seen so many impossible things since I had arrived on this world that I would hesitate to describe anything thus. Admittedly, earth scientists tell us that it is impossible to travel faster than light, but I also know that scienific ideas change. Who, at one time, would have credited that the wave motion theory of light would ever be seriously challenged?

Stretching myself on a heap of down I went to sleep; for it is my practice, when faced with an awkward dilemma, to sleep on it, and I usually wake up with my mind made up. But I could not sleep soundly: after a while I opened my eyes to see Heathcote sitting on his own bed, his hands on his knees, watching me grimly.

"Well?"

"It is clearly foolish for us to think of getting back," I declared; "therefore I propose to remain contentedly here, where at least we are comfortable."

"Haven't you thought of our helpless, unwarned cities falling before the unexpected attacks of the Martians? My own dear wife and child, surely there is someone you hold dear, helpless before the heat rays of the invaders: ruin and death stalking the earth."

Heat rays, yes. Rays a little longer than those that seemed to us, with the transformers on, as visible light, produced in such power that they caused anything combustible to burst into flame. There would be short rays also, known to the people of old, as X-rays and radium rays, that would peer through buildings and shelters seeking out living flesh. People touched by them might seem unharmed, might even be unaware of it, but they would be doomed to an agonizing death within a few hours.

And disease germs. Maybe the Martians had developed human forms of some of the scourges of hot, moisture-laden Venus, against which nature has provided our bodies with no means of defense. It would all come as a surprise, dozens of huge, well-nigh impregnable space-ships suddenly appearing to attack a world that had not dreamed of the possibility of their existence, and whose defenses were woefully inadequate.

"I doubt," I observed, "whether two solitary men could affect the issue in any way. Things will work themselves out: we cannot alter the issue even if we succeed in getting back safely."

"Then you refuse to aid me? Don't think I want you, I'd go alone if I thought I could run the ship singlehanded."

"It would be useless."

"Then I declare you a traitor to the human race, a renegade, a coward."

"Heathcote, take those words back. I allow no one to speak to me like that!"

"To hell with you, you miserable skunk!" He rushed at me, breathing hard, and I was forced to adopt a defensive attitude. He was a wiry little fellow of about ten stone, while I was something over twelve, and stood six-foot three. Even in my rage, I am slow to anger, I hated the idea of using my superior weight and reach to overcome him, but he gave me no option.

He came at me, feinting and moving his arms very quickly. He was a useful fighter for his size, but I was much handier with my fists than he probably imagined. His speed beat me, I had no idea which way the blow was coming: as the only thing to do I struck out with my left. My superior reach found him, knocking him on his back.

Absolutely undismayed, he was up again in an instant, attacking with fury. Somehow getting past my left lead he got home several rapid blows, one in particular on my solar plexus causing considerable distress through stomach muscles not so iron hard as they once had been. Breaking away, I knocked him down again. Thus we continued, my long left, the knuckles were soon raw and bleeding, usually kept him out, but when he got past it he scored freely. The fighting spirit of my boyhood days coming back to me, I fought with the one idea of knocking him out.

The end came suddenly. He had stumbled over my couch, and, not wishing to take advantage of him, I stepped back. As I did so I found myself firmly held, unable to move. A number of the plant creatures were behind me, holding my arms and legs with the suckers at the ends of those strong lower limbs of theirs. It was useless to attempt to break away from them.

Heathcote was similarly held. Catching my eye he laughed ruefully, wiping blood from his face. I was in a pretty bad way myself, with a beautiful growing specimen of a black eye; of the blow that caused it I had no recollection. While my body was battered and sore his head had been my easiest mark, so that he looked much the worst.

● If the plant creatures felt any surprise at our activities they had no means of showing it. The two chairs with the machines on them were there: and they promptly put us on them, clapped the transformers over our eyes and started out. Their handling seemed rather rough, probably because they did not realize our bruises hurt.

This time we did not travel so far as on the previous occasion, but entered a large mound nearby. As I afterwards learned, grave doubts had been expressed as to the efficacy of the machines for producing and recording thoughts in our minds, and our visit to the open laboratory in the hills had been for the purpose of testing them.

Now that their efficiency was proved they had been brought near so that the study of living humanity might proceed with all possible despatch, every minutest detail of the physical structures of our bodies being already known from the examination of the dead men found on the *Aristotle*.

It must have been the weirdest experience that ever fell to the lot of a human being: to be seized by things more like the white branching corals one sees under glass in museums than anything else I can think of, to be hoisted by them onto precariously perched chairs that seemed as if they *must* fall over, to glide with no visible means of propulsion into the open, out into a world where everything was red or black, to have something clapped over one's eyes and see this scene take on a myriad brilliant hues, to enter a round building and to find comprehensible ideas forming in one's mind, as though level, expressionless voices were talking to one.

The wonder of it prevented me from grasping quickly what they tried to convey. Our progress was very slow compared to what we afterwards attained when both they and I became more proficient in the use of the machines. I found that I thought, mainly, in words and pictures. When I made mental use, for instance, of the word, "electricity." I formed the pictures of a lightning flash, a light bulb, and an atom with one planetary electron leaving its orbit; and it was these pictures that the waiting intelligences perceived. There was much delay owing to definitions being repeatedly called for, for instance, I had to explain "light" as visible electro-magnetic rays.

Heathcote proved a poor subject. When they failed to understand him at the first attempt he would not take the trouble to think it again more carefully, but became annoyed. It was well for him that they were surely the most patient creatures that ever existed.

I was considerably amused to catch their repeated remonstrances; "It is not we that are slow of understanding. It is you that are impatient." Indeed, almost the only message he had for our hosts was the rather uncomplimentary one that he wished to leave them at the earliest possible moment. After their first abortive attempts to understand him they gave him up, and concentrated on me alone.

It was not for several days that my conversations with the comet people reached a stage that could be described as fluent. Most of our earlier efforts were spent in experimenting, in finding a common ground of understanding, and in the simple exchange of ideas, instead of attempting to combine those ideas into thoughts. By degrees I learned that my interlocutor possessed a name that sounded to me like Pahlo, and described himself as a "seeker after exact knowledge," as we should say, a scientist.

I described to him our lives on our home planet, and he in his turn described the history and ways of the people of the comet. The Black Comet had once been a satellite of a planet in an unthinkably distant system, but, a catastrophe overtaking their sun, they had crowded onto the satellite and set it wandering through the universe. He tried to tell me the method by which the world was directed in its wanderings, but my brain was incapable of grasping the explanation.

I did, however, succeed in obtaining a fair idea of how the warmth of their world was maintained during the passage through the enormous empty spaces that separate sun from sun: the colossal envelope that had been the first we saw of this world, and through which we had so startlingly plunged, was constructed so that its outer surface allowed every particle of energy (he insisted in talking of particles, and not waves, of energy) that fell upon it to pass through, reflecting nothing, while the inner surface was a perfect mirror that reflected back everything radiated from the ground below.

"Then the stars should be visible through it," I said, after thinking this over.

"They would be," he responded, "but for the diffused light reflected downwards."

Some time after this I asked him whether there was any way in which it would be possible for us to be returned to our homes.

"I had not thought of it, but probably it could be done. Do you wish to go? Your ship alone could not do it, but if we added improvements it might succeed."

That set my brain in a whirl. So certain had I been that we would never be able to get back that I had not seriously considered Heathcote's demand that we set out to warn earth of its danger, to interfere in a struggle we had left far behind, a struggle that had its origin in the injustices caused in previous generations. I could no longer shirk the problem: should I remain here, or should I attempt that journey through breath-taking distances back to our home, maybe spending most of our lives on the journey, and arriving spent old men, to find ourselves the only human beings left alive? If we were able to deliver our warning, of what use would it be? Generations would be required for earth to construct defenses that would give her any chance of avoiding extermination, even were she able to capture the mines of Ganymede, and what a hope, that! The comet was heaven to me: I understood these beings, and felt I should soon become one of them.

"But my colleague says we are more than a light-year from the sun," I objected.

There was a slight delay while he calculated how far an electromagnetic ray would travel in the time it takes for planet number three in the system they had just left to make a complete circuit of its parent body. "We are more than two light-years from your sun," he declared.

CHAPTER V

The Return

● "How can that be," I asked, "when our scientists assure us that the speed of light is the ultimate limiting speed of the universe?"

"That is because your scientists have nothing but that clumsy medium, light, to work with. You have but five senses, and with these you try to understand everything: it cannot be done, it is like trying to build a house with nothing but bricks, no mortar, no cement, no timber, tiles or glass. Your house would be blown down by the first strong wind.

"Your five senses, too, are extremely limited: you see only a narrow band of the spectrum, you hear little, as for touch your fingers are ridiculously crude, while smell and taste are practically useless scientifically. Imagine yourself on earth watching us through a telescope: we would appear to be leaving you at a speed much less than that of light."

I thought this over and saw that it was so. Each succeeding ray of light from the comet, supposing the comet gave forth any light, would take longer to reach an observer, having further to go; and thus the apparent speed of the comet could never exceed that of light.

"Then," I said, "it would be impossible for us to bridge the distance in our vessel, particularly as we would first have to overcome our frightful velocity in the wrong direction."

"That is just what would help you. The problem is one of turning round in a wide sweep, then of decelerating; both of which could be accomplished by means of rocket-propulsion tubes and fuel we could provide. These tubes of ours expel the fuel at a relative speed nearly equal to that of light, so that exceedingly minute quantities of it have enormous propulsive power. Meanwhile any ill effects on your bodies would be prevented by compensating appliances."

I sighed. My duty was clear, yet it was a wrench, for Pahlo had become a closer friend to me than any I had known on earth.

Unknown to me, my thoughts had been conveyed to him by the machine. "That is another matter," he exclaimed, "I was merely explaining how it could be done: you cannot be allowed to leave us, for we have not completed our studies of you."

Not having thought of the possibility of refusal I was greatly surprised, and launched at once into an explanation of why I must return.

"That," said he, "would, if the matter were not already settled, effectively prevent our granting your request. We on this comet are sufficient unto ourselves: in our passage throught the universe we study many forms of life, some high, some low.

"We interfere with none, nor shall we until we find a sun suitable for us; then, if need be we shall be merciless. The ultra-violet rays of your orb are too strong for us, therefore we have left your system. If your races contend amongst themselves they must contend; if you wish to return and attempt to influence the result of this conflict, then our principle of non-interference will not let us permit it."

I was up against a brick wall. I argued, I pleaded, I pointed out that we were the victims of aggression, all without success. Nothing of this did I tell Heathcote.

Through the days that followed I became more and more friendly with Pahlo. He took a fatherly interest in the slow development of my mind, in its gradual absorption of the comet-creatures' ideas. I was taken to see the *Aristotle*, now completely repaired and regarded as an object of interest. Great care had been taken, Pahlo explained, to destroy, both in the ship and in our bodies, any microscopic or sub-microscopic life that might cause harm on the comet. I now understood why I felt so full of health and energy.

Never did I relax my pleading, and, as the bonds between us became closer I felt that I was having greater effect. At last he said to me:

"Child, I have great news for you. Your request has been granted, you can return to your system. Such a step has never before been taken in the history of the comet, but I explained your longings, your desires, and it has been agreed. But I have become too fond of you to allow you to go straight back to destruction; I will give you some help in your war."

I suppose I should have been delighted at this, but I was sad. As time passed, and the preparations neared completion, I found myself longing to remain, striving to put off as long as possible the day when I should leave the comet forever; for it was futile to imagine that I could ever get back to it.

Pahlo had another interview with Heathcote, and that worthy thought that his own demands had secured our departure from the comet. I let him think so.

Well I remember the day of our departure; a black sea on which were red boats lapped in red foam on a dark red beach, and black and red plants grew on a black soil; for the light transformers had been taken away. Red ships carried the *Aristotle* up through red clouds that I could not see when I had the transformers on, to where a door opened to let us through the immense, red-lit mirror.

As the door closed I watched with sinking heart the great seeming hole in space, that was the comet, whirl away from us as we began to turn. All round were the cold, unfriendly stars, exactly the same as they appear from earth except that they shone with a sharp, piercing intensity. But for the absence of the planets the sky had altered not a jot that I could see from how it appears from just outside the atmosphere of the earth; for two and a half light-years was such a short distance on the stellar scale that it was insufficient to alter the apparent positions of those distant worlds.

● That is the end of the narrative the young journalist succeeded in obtaining from Felix Boddington, that strange figure who turned his back on the human race when all the riches and rewards the earth could provide would, at one time, have been freely heaped upon him. From now on we have to collect our material from the reports, letters and interviews of Captain Heathcote, with the accounts of other men who were with them in the latter stages of their adventures.

It was with immense satisfaction that Heathcote found himself again aboard his familiar vessel, its paralumin floors beneath his feet, his familiar control-board in front of him. The picture of his wife and child was still there, and with a sudden impulse he took it down and kissed it, his eyes very moist.

There was, of course, a difference. For a crew he

had Boddington only, he had been instructed to make no attempt to control the vessel unless necessary to avoid meteors until they were within the Solar System, and they were forbidden to go beyond the small number of compartments where artificial gravity prevented their feeling the effects of the crushing swerve and deceleration.

The automatic arrangements whereby the comet-people ensured the return of the *Aristotle* were so extremely complicated that they have baffled all human attempts to understand or imitate them. Nevertheless, with a hint here, a suggestion there, they have thrown light on many an obscure point, and given an enormous impulse to terrestrial science and space-navigation. The composition of the rocket fuel they used seems to be beyond human understanding, but, at the moment of writing, it seems not altogether beyond hope that men may ultimately succeed in producing artificial gravity in crude imitation of that used by the comet-people.

From earth they were invisible, as they were approaching it at a speed greater than that of light; while they themselves saw nothing of the sun. Light, I think, is the most baffling thing we know of. The time that a light ray takes to travel from one object to another depends on the distance between them at the time when the light wave (or light particles, as some scientists think) *starts* on its journey: it makes no difference how any of the objects move about after that. So if Heathcote had worn a hat, and that hat had been a light hour further from the sun than Heathcote himself at a certain moment, then supposing Heathcote to recover his hat and put it on his head during the two and a half years the light was traveling, then Heathcote would see the sun an hour before the light he saw reached his hat. It seems to follow that he would see the sun through his hat if he tried, no matter how opaque that object might be. I give it up.

Heathcote fretted considerably at being unable to locate the sun. Using his most powerful telescopes he searched and searched for it, without result. The terrific discharges of the comet-people's rockets produced an incessant shuddering throughout the ship, the framework of which had been specially strengthened.

While there was never any real companionship between the two men they now learned to tolerate each other more. Heathcote began to recognize in the other's singular make-up the qualities of pride and courage, and tried to think that these compensated for other deficiencies. The only rift in the lute was the fact that Boddington merely laughed, and refused to share Heathcote's growing anxiety or his suspicions of the comet people because he had lost the sun.

After many days that cause of disagreement went, as the glorious sun, without the slightest warning, suddenly appeared—big, bright, blazing and quite close, as though it had that moment sprung into being. As they watched, it split into two, one half becoming slowly smaller and fainter. They took it for an optical illusion, but it was merely the image that had set out for them when they were further away reaching them at last. For days they would be able to see this image of the sun when they looked in the right direction, but it dwindled so rapidly that after the first hour it caused them little inconvenience.

The ship passed through the solar system, then began to beat its way back, still decelerating: they fell into an orbit round the sun, then the vibrations ceased. Heathcote took over control and settled himself to the task of making the orbit of the vessel the same as that of the earth.

"How long would you say it is since we landed on the comet?" asked Heathcote, looking up suddenly from some papers on which he had been making a series of calculations.

"Seven or eight months," said Boddington, promptly.

"Time must be different on the dark comet from how we know it," observed Heathcote; "the alterations in the positions of the planets show that over three years have elapsed since we left Ganymede."

CHAPTER VI
On Threatened Earth

● Was it a world void of human life, run by invaders from Mars, or had they been successful in reaching it before the gathering storm broke? Heathcote had been careful to give the other planets and all recognized space-routes a very wide berth, so that their arrival would be unheralded. It was essential to their plans that the Martians should have no warning of the return of the supposedly wrecked vessel. As they looked down from space the world certainly looked peaceful enough, but that proved nothing.

"I'm landing," called Heathcote. "If the enemy are here our number is up anyway."

Using the comet rocket-tubes for deceleration, the ship plunged through the atmosphere at a rate never before attempted by a landing vessel. The ground poured up at them, continents and oceans flowing over the horizon out of sight. A strident piercing scream, suddenly blaring forth, startled Boddington nearly out of his skin: Heathcote had started his propellers.

The landing field in Pennsylvania appeared. They swooped down on it, checked sharply a dozen feet from the ground, then dropped with a crash. Heathcote was in no mood for the niceties of a landing made according to the regulations.

A dozen men in uniform came running up, to the great relief of both of the space travelers. The foremost man was waving his arms in a request that a port be opened. Some time passed before his request could be granted, and the two men leaned out to hear what he had to say.

"Who is commander of this vessel?"

"I am!" snapped Heathcote.

"Then the commander of the space-port wants to see you at once."

"Tell him he will, later," replied the captain, slamming the port.

"Fool," he observed to Boddington, "he knows perfectly well I can't leave the ship till I'm sure everything is in order. Let's see if we can find some cigars."

There were no cigars left in the ship's stores, but there was enough tobacco to make a pipeful each. After smoking these they made a leisurely survey of the vessel. Heathcote stood a long time gazing reflectively at the compact, powerful rocket-tubes from the comet.

"Do you think," he murmured, "that I can certify that these things are, 'either unloaded or in such a position or condition of safety as to be incapable of causing damage or injury by starting unexpectedly?'"

At last the captain had satisfied himself that all was correct, then he donned his official uniform, swung open the main doors of the ship and strode out, followed by Boddington. Across the sparse turf they went and round the imposing buildings to the front entrance, through the imposing double doors, along a thickly carpeted hall to where Heathcote knocked sharply on a door marked, "Commander. Private."

Getting no answer, the captain pushed it open and strode in. A pale thin clerk at a desk looked up in surprise.

"Captain of space ship just arrived, come to see the commander," announced Heathcote; "and tell him," he added, as the boy moved to respond, "that we can't wait here all day."

The clerk blinked, then disappeared through a door. He was accustomed to harsh, bullying captains, but they usually cringed before the commander.

"What?" they heard an angry voice later, "I'll see him, I want to see him."

Waiting for no more, Heathcote opened the door and marched in, followed by Boddington. A white-haired man with a square jaw was sitting in an easy chair by an atomic heater. The boy, after a frightened glance at the intruders, fled precipitately.

"Who is this man?" demanded the commander, furiously, indicating Boddington.

"He comes with me."

For a moment it seemed there would be a conflict of wills between them on this point, then the commander went on to speak of something else.

"Well, captain," he began, with icy emphasis, "What have you got to say for yourself? You land here in rash, dangerous fashion, you fail to give warning of your approach or notify your intentions, you barge into my private room in a most insolent manner, and, as I have only just learned, the name of your vessel, the name of this company, even your planet of origin, have been painted out in the sides of the ship. "Why is this?"

As he spoke his bullying manner faded before the unrepentant, truculent air of the other. Here was a man who had made his dismissal from Space Liners, Inc., certain, and who seemed careless of the fact: the commander's power over him was therefore gone. Moreover, Heathcote had laid himself open to serious charges in a court of law.

"Our arrival must be kept secret," announced Heathcote, curtly. "The ship is the *Aristotle*, which was probably reported lost about three years ago. I have to report the loss of the cargo and all the crew with the exception of myself and this man here; and we have information regarding the matter that we must at once lay before an authoritative representative of the government."

"*Aristotle*," muttered the man in the easy chair, "yes, I remember the loss of the *Aristotle*. How do you account for her disappearance and where have you been hiding her?"

"Mutiny. It is about that I wish to lay information."

"You two are the only survivors, and the cargo is lost?"

"That is so."

"I see." The commander threw in a switch. "Martin there?" he called. After a brief delay the features of the hangar foreman appeared on a screen.

"Have you boarded and inspected the space ship just arrived, Martin?"

"I was just about to ring you up, sir. Not a soul aboard, no cargo of any sort, and a lot of extraordinary fittings."

"Is the vessel damaged in any way?"

"Apparently not, sir."

Ringing off, the commander stared at the red glow of the atomic heater for several seconds.

"Who would you like to see?" he asked presently, his face inscrutable, "the State superintendent of police, I suppose."

Heathcote nodded assent.

"If you gentlemen will wait here I'll send for him."

● "I have my doubts about that fellow," declared Boddington, when the door had closed behind him. "I fancy I heard a key turn in the lock. Couldn't he ring up the police from here?"

The tall man tip-toed to the door and stood listening. His ears were exceptionally acute, and he could just hear the commander's voice.

"That the superintendent of police? Deputy super? Well I guess that's just as good. I'm Charlesworth of Space Liners, Incorporated. Recognized me didn't you?

"Listen here. I've got two men locked in my private room. Yes. To be apprehended. May be dangerous. Yes. I'm charging them with murder and piracy in space. No, no definite proof . . . Good, do . . . . Yes, the charge includes Martians, so that the representatives of that planet will have to be informed . . . . Ticklish business, have to avoid stirring up interplanetary difficulties . . . . Ten minutes, can't you get your men here sooner than that? They may be armed . . . . Right you are. I am justified in using force to detain them . . . . All right, but don't be long."

In more sober mind the two men might have foreseen this result of their precipitate actions. Their heads full of the approaching war they had forgotten that they were on a planet comfortable in its calm security, who would see them merely as two men with wild tales, just as Charlesworth had seen Heathcote as nothing more than an insubordinate space captain.

Their hope of a secret warning was gone: they would have to declare their identity in open court, tell their story to defend themselves, probably, as the Martian representatives could pull strings, be disbelieved and jailed, perhaps executed; while the Martian preparations went steadily on, and the fiery doom of humanity drew closer and closer.

"We bin kinda hasty," Boddington summed up the situation, while Heathcote growled foul language.

Moodily, Boddington stared out of the window. Beyond a small courtyard where evergreens grew in tubs, and flowers, whose glory had departed for a season, lined the paths, past a garden where washing hung and a child's swing dangled from a tree, across a wide

space where grass strove hard to grow on shingle, he could see the *Aristotle* being hauled into a shelter. Farther away, little distant autos crawling along the twin roads of the highway.

"Fifteen feet to the ground," he announced. "What of it, man of action, shall we wait to be caught or shall we make a break for freedom?"

Heathcote looked out. A nasty drop, but soft earth to fall on. "Out with you," he said. Boddington lowered his long frame out of the window till he hung by his fingers from the sill. Heathcote, grasping his wrists, let him down the length of his arms.

"Now when you drop land with knees bent. Ready?"

Down he whistled, scraping one knee on the wall. There was a violent jar, and he was momentarily uncertain whether he was injured or not. He found himself staring through a window, meeting the gaze of a motionless woman who sat at a table with a piece of bread halfway to her mouth.

Having no time to reassure her, he reached up for Heathcote. Losing his balance, he failed to catch him, but effectively broke the captain's fall by falling backwards with him and having most of the breath knocked out of his body. The statuesque woman had so far come to life as to have recovered the full use of her lungs.

There was nothing for it but to run. They leaped a white railing and raced across the sparse turf. Behind them the alarm was quickly raised, and shouting men took up the pursuit. A number of wondering mechanics in blue overalls appeared in their line of escape, and held out their arms like men trying to stop frightened hens. Boddington knocked three of them down with pole-like rights and lefts, while Heathcote tore into the group, all waving arms and legs like an angry kitten. It was hopeless: realizing that there was a fight on, the mechanics struck back, and the two men, dazed and groggy, were borne to the ground just as the police plane settled down before them.

Within an hour they were locked in the cells.

There are still today many who would like to know how the facts of the arrest of Heathcote and Boddington and the charge against them became public knowledge so quickly. Charlesworth denied telling the facts to anybody but the deputy superintendent; the police swore their every act was as laid down in the regulations; nobody questioning the mechanics was able to get anything out of them but, "don't know, don't know, don't know." Yet, before the keys had turned on the two, every News Service machine in America was blaring forth the words, "Mystery of the loss of the *Aristotle* solved. Ship recovered. Dramatic arrest of captain and passenger. Space-pirates trapped."

"Have important prisoners here," the superintendent, who had been hurriedly recalled to duty, told an important government official in Washington, "on a charge that may lead to interplanetary complications. May be advisable to have them questioned."

The important official sent an unimportant official with a very important manner to conduct the interrogation. To him Heathcote outlined his story. "Seems to be a case of delusion," the unimportant official reported. Nothing more was done about it, but the machinery of the law moved in its usual way; the prisoners were brought out, looked at, and remanded for three weeks; then brought out, looked at, and remanded for four weeks.

Out in space the menace they had foreseen drew steadily closer. As soon as the Martian authorities learned that the supposedly destroyed *Aristotle* was recovered, with survivors, the great fleet that had been secretly growing for so long set out; space ships sighted it only to be destroyed; and everywhere where Martians were gathered together they learned the news on their secret wavelengths, and any terrestrians near, succumbed while they slept, usually to the deadly *borga*.

Meanwhile earth, though puzzled by the breakdown in communications, which was ascribed to magnetic disturbances from the sun, continued calmly on its way, discussing the most painful treatment that could be inflicted on the men who would have warned it; for the horror of their crime had inflamed imaginations.

● Then occurred, in the words of one of the News Service Companies, "Heathcote's outburst from the dock. Expert's opinion that he is insane."

The facts were these: the young attorney who at first agreed to conduct the defense in the hope of obtaining considerable notoriety refused when he heard the impossible story they put forward. Heathcote and Boddington were therefore obliged to conduct their own defense. The case against them rested so much on premises and assumptions that those responsible for conducting it sought to put it off as long as possible in the hope of more definite details coming to light. They had just been remanded for the third time and were about to be led away, when Heathcote, in the words of the News Service, "became very excited and started shouting loudly."

He declared that he objected to these repeated remands, and demanded that the "poltroons and cowards" bring forward their accusations. Was there any justice today or not? (At this point a policeman reached out to take hold of his arm, but was sent staggering by a push from Boddington, who had been leaning against the dock in such a manner as to suggest he was incapable of rapid movement. Other policemen rushed up.) Their story was true, they had been overwhelmed by a mutiny of Martians. Other ships had met the same fate, which was the reason why no messages had been received. The Martian menace was rapidly approaching the people who sat so smugly in the courtroom, and when they saw their cities leveled by fire and ruin—.

That was as far as he got. The prosecution seized the chance for further delay by asking for a medical report on the state of his mind . . . . .

The "message that staggered the world," as some writers have called it, came three days later. Actually it did nothing so energetic as that; people listened to the account at their breakfast tables, then turned the dial until the indicator pointed to Sport, for the great annual Chicago Stakes for three year old colts and fillies was scarce a week away, and hardly an adult in the world but had at least a tenth of an international credit unit on his fancy. In an ultra-mechanical world, the racehorse had gained instead of lost in popularity.

The message came from space, from a small vessel with a crew of four pleasure-cruising between earth and Venus, and, after they had given, very briefly, their identity and approximate position, went on thus:

"Piracy and Murder. Some six hours ago we sighted a vessel proceeding from earth, as though making for Mars, and, about the same time, seven others approaching it from the opposite direction. Received messages from the vessel bound for Mars, but were unable to reply owing to our transmitting gear being out of order, a fact to which we undoubtedly owe our lives. The approaching ships remained silent, and, when they were within close range of the earth ship, the latter suddenly blew up. Being to sunward of the fleet we were unseen by them, and changed our course to follow. Later saw another vessel similarly destroyed.

"Magnetic tension among our instruments proves that they have succeeded in locating the source of our signals, and are drawing us towards them on a magnetic beam. May be silenced at any moment now.

"The pirate ships seem to be sixteen in number, a group of nine following the first group of seven. They are at least three times as large as the biggest vessels previously known, are roughly the shape of fish, appearing from the sunward side like polished aluminum, and are approaching earth at—."

That was all. The speed of the hurtling menace was never transmitted.

People heard the News Service comments on it, and it formed a topic of conversation second only in importance to the big race. Experts were able to state that the authorship of the message and the location of the transmitter were as stated, but as to its truthfulness, of course, they were unable to say. Some acute persons, connecting it with Heathcote's outpourings, suggested that he had accomplices. Discreet inquiries failed to disclose any connection between either of the accused and anybody known to have been on the ship.

The news service companies made all possible capital out of it, in long vocal articles on, "Is Heathcote right?" proving that the fleet described could not possibly exist; that Martians were not capable of waging war; that if the fleet had left Mars at the time when communications first began to break down they would have been here before now, and that such a fleet would not pass the point indicated in the message. A few nervous persons were reassured.

To us who know the course taken by subsequent events all this seems incredibly foolish; it is a fact that the Martian fleet took a long time over its journey and chose a circuitous route, but their reason for doing so seems now so obvious that it is almost incredible that it should not have occurred to any of the supposedly intelligent men who examined the question.

Any experienced space-traveler knows that a dark object on the sunward side of one is practically invisible unless one is in its direct shadow; the Martian plan was to approach the earth from its sunward side and to hang, imperceptible in a sunlight sky, attacking that part of earth in the twilight belt.

That is why the disasters, when they did occur, always happened either about the hour of dawn or approximately at sunset.

CHAPTER VII

Boddington's Surprise

● The Astronomical observatory on the moon reported the occulting of certain stars by unknown moving objects. Some discussion in scientific circles followed, and outgoing ships were warned to keep a sharp lookout for meteors. Thereafter the moon shared in the general silence.

The facts of the destruction of Tokio are too well known for me to recount them here. Situated in the most densely populated part of the world, the fourth largest city on earth, having the largest airport, housing the biggest air-liners in the world, it was completely wiped out by what was thought to be a terrific earthquake in the early hours of the morning on the 19th of July, 2257. Scarcely was the world aware of the shock before Winchester the most important space and airport in existence, suffered a similar fate.

A man with sharp eyes looking through a telescope towards the rising or setting sun when it was not quite light might have noticed several short lines barely visible in the sky, the sunlight reflected from the extreme edges of the Martian vessels, as the moon appears at its first, faintest newness. Initially they attacked only the strategic points of the planet, and every place to suffer in the first onslaughts was either a spaceport, an airport of importance, a power works, or a center of government. Earth was bewildered by these rapid blows.

Then a news service operator succeeded in obtaining a complete movie picture of the destruction of Chicago. Traveling over the hills overlooking the town he saw what he took for an extensive fire, and obtained a private airplane to take a picture of it. Fortunately for himself, the many planes he saw crashing inexplicably over the city caused him to keep at a considerable distance. Owing to the mistiness of the morning he used an infrared film to get a clear picture, and the heat rays of the invaders came out clearly on it.

It is an awful picture, totally unfit for publication. It is reported that the hardened checkers of the news service company who, gloating over their success, viewed the picture before passing it for publication, screamed with terror at what they saw.

The film has been preserved as an historic record, and can still be seen by the curious. In the uncanny clearness of ultra-red photography the city stretches out before us, looking somewhat unnatural because distant objects are as distinct as those nearby instead of being veiled in a film of mist. There are the wide roads, the flat roofs of the spacious city with airplanes setting off and alighting and pleasure boats on the lake; even the obsolete railway stations are shown with pitiless clarity, and somehow take on a beauty of their own.

On the extreme right appears the race course with its huge stands, a certain amount of activity already going on about it; for, by an ironical stroke of fate, the disaster occurred on the morning of the very day when eighty-seven of the fleetest horses in the world were to line up at the gate before starting on the mile and a half of the most important race in the world. Flags are flying, and one huge banner bears a bookmaker's advertisement for posterity to read.

Pale white beams, invisible to the operator, but clear to the eye of the camera, are shining slantingly down from the East, which the shadows show to be the direction of the sun. Distant buildings are crumbling and smoke is rising everywhere in the track of the moving beams, the source of which is far away in the sky. Suddenly one passes in the foreground, leaving a wide trail of conflagration and ruin: there is much confusion, small figures moving erratically about in the visible parks and

roads, a man and woman pushing a child in a perambulator being particularly distinct.

She snatches up the child and runs with it just as another beam, sweeping methodically round the doomed city, passes near. Then it was, probably, that the checkers screamed: one is not prepared to see human beings caught in the beams. . . . It is said that nobody has ever seen that film through to its conclusion, to when nothing remains of the vast cosmopolis but one extensive, smoking ruin.

The panic caused by the bare recital of these facts has been recorded in a thousand places. How ripples first, then waves of terror, spread in a few hours over the earth; how people flocked out of the towns that were obviously the marks of the attackers, seeking open spaces, how great communities gathered together away from their homes, and how exposure and lack of food, water and sanitation caused double the damage the Martians did directly, is not for me to record here. Our concern is with Heathcote and Boddington only.

An order withdrawing all charges against them and directing their immediate release arrived at the jail at 3:30 p. m. The governor, after having the order repeated into a recording machine to safeguard himself, (governor, jail, machine and record were all destroyed several hours later) sent for them, informed them personally, and the two walked out. Their first act, on finding themselves in the streets, was to spend a fiftieth of a credit unit on "See and Hear" machines on a corner; for, although they knew the main facts of the war, the news had reached them only in vague, general terms.

However, what they learned with their eyes to the eyepieces and their ears to the phones contained little that was new, for already the organization of the news service companies was beginning to break down. A confirmation of the urgency of the situation, the names of more places that had suffered, a vague exhortation to be calm, such was the net result of their expenditure.

Airplanes thronged the sky, and there was a general air of aimless haste: an old man, well-dressed and with streaming white hair, rushed down the center of the road screaming, "It is the end. The end. Humanity is doomed."

Boarding an air-train for the short distance to the space-port, they found it as yet unharmed, being one of the smaller places as yet undisturbed by the Martians. Walking irresolutely across the ground, a man, looking haggard and thin, proved to be Commander Charlesworth. Perceiving them, he seemed to be turning over possible greetings in his mind: finally, "What do you want now?" he demanded, hoarsely.

They made known their desire to assist in any counter-attacks being made on the Martians. "And what have I got?" cried Charlesworth; "vessels a hundred yards from stem to stern against ships that must be, if that message from space was true, more than half a mile long. Midges against elephants."

"Something must be done," snapped Heathcote, "If only to distract their attention for a while. How many can you spare?"

"Jack," it was Boddington's voice, "if we had the *Aristotle* her speed would enable us to leave the others far behind. Give us six men and let us skirmish on our own account."

"It could be arranged," said the commander.

● After consideration, Heathcote assented, and six volunteers, they could have had twenty, were called for from among the mechanics. Shaking hands with each man, the commander wished them good luck and a safe return: who was to know that another hour or so would see the occupants of the *Aristotle* alive and well, and the commander and all others at the space-port still in death?

Let run at full blast, the propellers screamed in agonizing intensity as they dragged the vessel upwards. When they reached what they thought was a safe height two of the comet rockets were discharged at a fraction of their power: onlookers were thunderstruck to see a great trench torn in the ground, an old, fortunately deserted, building collapsed, and the space ship, in marked contrast to the usual painful initial climbing, sail upwards with the ease of a lark. To this day Heathcote's Dip is pointed out to wondering tourists.

"All hands to muster on floor number 10." The strident, mechanical tones rang through every compartment. When satisfied that everybody was present Heathcote announced, "I am about to put on extra acceleration in order to pass the enemy ships and get to sunward of them. No one is to leave this floor until I give permission."

The men stared in amazement. Was the man mad? Extra acceleration? Already they had endured fifteen minutes of acceleration such as never had been heard of before. As they thought this they felt the force that had been tugging at their bodies with twice the strength of gravity removed; only a normal gravity remained.

"But you've stopped accelerating, Cap," observed one, presently.

A slight smile played about Heathcote's lips as he suggested to the speaker that he look out of the window. The man did so, to stagger back with an incredulous cry: and forthwith the window was crowded with staring, astounded men. Instead of seeing the earth as a huge body filling the heavens it was a distant globe, still retreating.

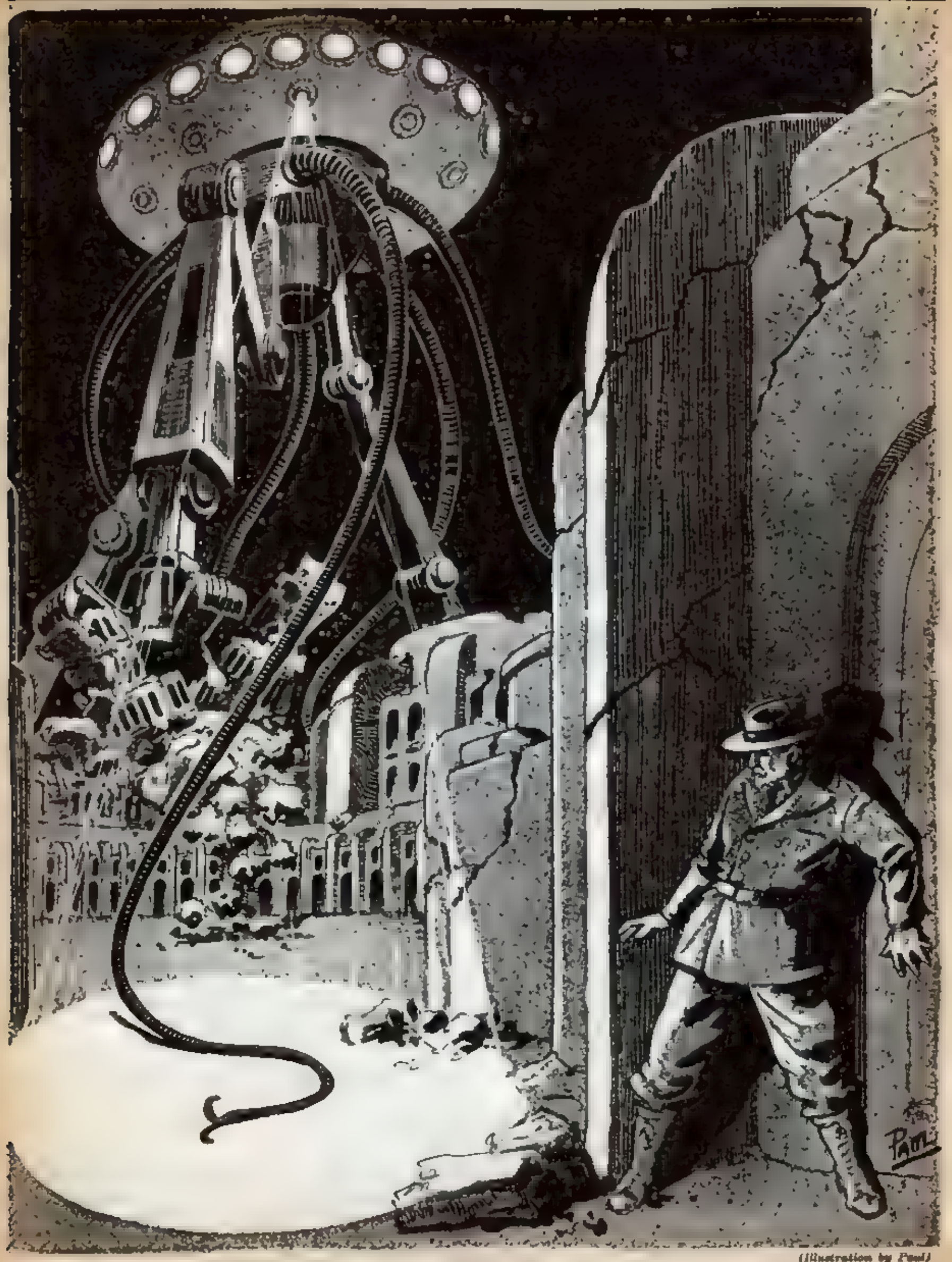
"You see the effects of my extra acceleration," observed the captain, "in spite of the fact that I applied it for a few seconds only, until we were past what I judged to be the danger zone. You were prevented from feeling the effects by the artificial gravity adjuster beneath your feet, which under any circumstances maintains the conditions to which it is set, at present the amount of gravity normal at the surface of the earth. Now you know our chief weapon, our frightful, unheard-of speed. While I maneuver into a position where we can see the enemy without being seen by them I want you to discuss plans of attack."

An intelligent-looking man suggested that they should set up an orbit round the earth that would carry them close to the hostile ships and play rays on them every time they passed: their speed would enable them to get away before they could be struck at.

"So I thought, at first," remarked Heathcote, "but have you considered how brief the application of our rays would be? How can we hope to damage ships with armaments such as they have in such a way?"

The approaching earth loomed larger beneath them, and they were able to detect in telescopes the Martian ships shining silvery gray in the full glare of the sun,

(Concluded on page 86)



(Illustration by Paul)

And now began a grim game of hide-and-seek. Hargry was evidently determined to smash the entire city to the ground and thus destroy all hiding places.

THE MAN WHO AWOKE

IV—THE INDIVIDUALISTS

By LAURENCE MANNING

● As Mr. Manning so expertly points out, human evolution does not proceed in a straight line upward. There are curves, blind alleys which must be retraced, cross paths at which important choices must be made.

History, as he shows it, is filled with movements of the human race attempting to find a form of society satisfying to everyone. At some periods one group gets control and works its will on the race—their energy dies out and they give way to another group with perhaps contrary ideas.

We saw in the story of the Brain, the race controlled automatically from a central point and obedient to one master. Now we witness the reverse, a state of perfect individualism, in which no restraints are placed upon individual actions. This is a bully story.

● At the establishment of Meanus there was holiday.

Little Vard climbed to the top of the partition wall and would have fallen had he not been found by some of the older children. Trogly, who was twenty years of age, had coolly taken possession of a living machine and had set off to see the great wide world—a project he had been impatiently awaiting, for the past six months, to carry out at the first opportunity. So the responsibility of the "household" fell upon young Bork and the girl, Farinda.

In the year 20,000 A.D. this was less difficult than one might think. In the first place, food and drink were automatically produced by the living machines at the mere touch of a button. Control of temperature and humidity in the rooms was similarly arranged for, by the almost indestructible atomic motors in the power room. There was little left, except the education of the other children and the sound-and-sight library made this task a sinecure.

"But where has Meanus gone?" Farinda asked Bork.

"Surely you remember in the history record we read last week about Winters—the man from the past?"

"Yes—I do. He went to sleep eighteen thousand years ago and woke three times. He is to awaken again this year."

"Exactly! And Meanus wants to bring him here to study and perhaps to breed from."

"Oh! But they don't know where he is sleeping, do they?"

"They know where the first city was located after the Exodus. He was buried beneath that city somewhere."

"But then . . . when will Meanus be back?"

"Perhaps not for several days. We had better look over the breeding racks this afternoon."

"The two young people walked slowly through the building looking in at each room, for there were some dozen children to be accounted for, and ended their saunter at a locked doorway which they opened. Inside was a set of shelves on which rested huge glass jars and in five of these great containers were babies less than a year old. They were supported on cloth stretched taut between two rollers which turned slowly beneath them. Even as the two entered a fine spray of warm water commenced to fall in each jar, for it was time for the bath. This was followed by the hiss of warm air jets and, now dry, the infants began groping along the sides of the jars for the feeding tubes and commenced sucking nourishment from these very contentedly.

One of the five, however, did not react so normally and Bork frowningly seized a controlling lever that permitted him to move the tube about inside the jar. He succeeded in getting the end of the tube into the baby's mouth but after a moment it spat the thing out again and, although no sound was audible outside the jar, it evidently was crying.

"I can't imagine why Meanus keeps this one," the boy said calmly. "It has been abnormal in feeding ever since it came from the incubator."

"Oh, I suppose he has had the trouble of raising it so far and now wants to see what its reactions will be before he destroys it," responded Farinda. "After all, he only has five experiments under way just now"

Bork grunted in reply and peered a moment through a glass peephole set in the wall of the incubator. Here a dozen bottles of varying sizes could be seen filled with liquid and in each a human embryo in progressive stages of development.

"Everything seems all right here, as usual. Let's go back to the library."

But Farinda was staring at him with a peculiar expression in her eyes. She shook her head obstinately.

"You have been doing the things you wanted to do all day," she said. "Now I am going to do what I want to do—and I'm tired of having you around."

Bork shrugged his shoulders indifferently and set off down the corridor while the girl waited until he was out of sight and then set off about her own affairs. For the child is father to the man and even the child of this age found her own company preferable to any other at times.

Meanus, a thousand miles away—bull-necked and

swarthy,—was grinning cynically in front of a sign posted on the wall of an ancient ruin. His parted lips revealed the pink and white gumnails that had long ago replaced human teeth.

"'Adults are warned that the man Winters is for my laboratory,'" he read aloud. "If Hargry thinks that I shall pay any attention to such nonsense he must be mad!" he exclaimed, and looked around him suddenly for he had heard a slight noise. It was a stranger he had never seen, seated in the midst of a huge and complicated structure evidently capable of flight, for it had arrived through the air.

Meanus made a step to the side of his little airship and the two beings stood watching one another in silence.

"And do you also want Winters?" asked Meanus savagely.

"I wish to see him and examine him for a moment," replied a woman's voice. "And you?"

"I want to try some experiments with him."

"Ah! Well, we may have to wait some time—his awakening is not known to the exact hour, by any means."

The great machine rose lightly into the air and settled down some hundred yards or more away, beside a group of low stunted trees. Meanus grunted impatiently and set about exploring the ruins. The ancient walls were gray and weather-worn and inside the decrepit buildings there showed accumulated dust and debris in all directions. But there was a full square mile of ground to cover and presently the hopelessness of his search caused Meanus to pause and return to his vessel. Time enough, he thought, when Winters emerged into the sunlight.

The ship he had arrived in was perhaps twelve feet long and four feet wide—just high enough to sit upright in. In the tapered tail was storage space and set in the roof were the two vacuum wheels that revolved at terrific speed and set up a continuous suction drawing the vessel upward. The atomic motor was insignificant in size—six inches square—but rated nearly two thousand horse-power and ran for a week on a few ounces of powdered rock. Meanus entered the cabin and sat impatiently in the pilot's seat looking out at the ruined city through the observation ports.

So it came about that Valendum found two people waiting when *he* arrived. He had come straight from his breeding laboratory intent upon securing the ancient Winters for his own purposes—which were not precisely conventional. There was a tank beside his laboratory—a huge affair two hundred yards long. In it there swam queer half-human things with gills. It was the glorious ambition of Valendum to breed a race that could people the waters of the globe even as ordinary humans peopled the land and to this end he wanted to experiment with embryos descended from Winters, whom he considered much nearer in blood to the original amphibians than any human material with which he had yet been able to work.

Valendum recognized the airship of a brother biologist and promptly dropped a bomb upon it. The explosion threw dust high into the air and tore a ragged hole in Meanus' vessel—but did not cripple it. In five seconds the two airships were circling each other high in the air and trying to bring heat-rays to bear. So it happened that neither saw the approach of Hargry . . .

It was perhaps only natural that the biologists were chiefly interested in the advent of Winters. To a chemist or a physicist or a musician he was merely a famous savage strangely come alive from the dark ages of ancient history. To the biologist and breeder of humans he was a new strain of blood—a prize worth fighting for. And in this day and age to desire was to seize and the rights of others were the concern of others. It was a world for giants—for gods. Little men had no place or joy in it—if indeed they ever were permitted to be bred or, by chance once bred, if they were allowed to reach adult stature. For breeders seldom released for the observation of others any humans who could be termed failures.

Now Hargry was at once the most ruthless and at the same time the most able of the experimental biologists. He it was who had bred Dagla—the curious genius who, at the age of twelve, had designed the great fighting machine in which Hargry ventured abroad. Nearly a thousand feet high it stood on three steel-truss legs that could carry it over the ground a hundred and fifty yards at a stride, under the impulse of its powerful atomic motors. In a steel palace at the top Hargry directed his machine and, if he wished, ate and slept there in perfect security and comfort for weeks on end.

Hargry wanted Winters both for breeding and, after that, for the operation table that he might thoroughly satisfy his curiosity as to the evolutionary changes produced by the last twenty thousand years. He had been here a week before and, after an hour's wait, had posted his claim and departed. Now, to his annoyance he observed three people at the ruined city and he hastened his stride.

● In a lead-lined chamber fifty feet beneath the ruined city the X-rays and ultra-violet lamps had been burning for three days now and the wax-faced figure on the couch had been stirring once in a while. The medicine tube had pulsed twice with its measured flow of stimulants and finally Winters' arm raised weakly and pushed it away from his mouth, where it had rested for fifty centuries. He sighed and opened his eyes wearily. For half an hour he lay there quietly watching the ceiling and with the light of reason once more glowing behind the gray eyes he swung his feet to the floor and stood shakily.

The three days of drugged sleep and the nourishing stimulants had worked their miracle in his wasted tissues and he felt his strength returning slowly as he procured clothes from the vacuum box and opened the door of his lead-lined chamber. Once more the old thrill of discovery ran through his veins. Up above were fresh scenes—new developments in the great epic of humanity—ready for him to study and puzzle over.

Fifty feet he climbed up the steps of fused glass and pulled the little lever that had been arranged for him by his long-dead friend Eric. Instantly a crack of light appeared and widened into a square opening through which he climbed slowly and laboriously. He stood in a small room, floored with dust, and from mere instinctive caution walked over to the corner of the room and rested his foot on the floor to see the great open slab slip gently back into its place. He marvelled at

the perfection of the fitting, tight after all these centuries, and idly drew his cloak over the dust to efface the marks and found to his surprise that he could not tell where the crack had been.

Unsteadily he went into the next room and stood at the door blinking at the strong sunshine and marvelling at the ruined and neglected appearance of this once new and thriving city. Once more, he reflected sadly, had a new group of friends come into his life and gone on to leave him mourning them thousands of years afterwards. But more practical thoughts came to mind. Here was a long deserted city. He had scant food and no means of transportation. He must set off immediately to find people who could supply his lack.

He had watched this city being built and, of course, knew every street of it, so he had no hesitation about his course and set off along an avenue and turned into a great square. As he did so he heard a great explosion in the air and turned, startled, to see low over the buildings on his right, a very Eiffel tower on legs rushing toward two airships with great coiled tentacles half stretched out to seize them.

The airships, he observed, were more intent on fighting each other than warding off the attack. The steel structure seized one and threw it crashing to the ground and not till then did the other hurl an explosive at the giant and commenced circling around as though preparing to attack. Even as Winters gazed, mouth open beneath the unkempt hair that covered his face, the second airship came a little too close and was struck by the tip of one flailing tentacle and broken in half. It fell out of sight and a terrific explosion sent up an enormous cloud of dust half-way to the giant's waist.

But metals were wonderfully strong in those days of mechanical perfection. The first ship, battered and broken, was still capable of flight and rose limpingly out of the dust cloud and made off westward with the gigantic machine after it in hot pursuit, for it moved slowly and at a low altitude so as to suggest to Hargry an easy capture. As a matter of fact, it was quite ten minutes before a flailing metal tentacle sent it to the ground where a great leg crushed it shapeless.

Winters, in the meantime, cautiously approached the scene of recent combat and stood outside the area of buildings gaping at a great hole in the ground. The dust had settled on the trees nearby making them grayish white. Not for a minute or two did he notice the woman in the great living machine. Her calm and peaceful face allayed his first fears and he approached closer, while the woman studied Winters with great attention. Rods and wires and shining discs radiated from her seat. The machine spread around her for a dozen feet on either hand. Upon closer view the terrific complexity of it all was still more apparent. It was a maze of meaningless apparatus to Winters. The woman nodded her head suddenly.

"This puzzles you," she decided, as if thinking out loud. "Now why should it? What could be simpler? Compared to the same apparatus in your own time and country it is a marvel of simplicity!"

"The same apparatus—in *my* time?"

"Yes. You called them cities," she explained, "and that is essentially what this is. You had many thousands of people in each city, it is true—I suppose you could not afford many cities?—while we have a city for every inhabitant. But otherwise they are, I should imagine, much the same."

● Her hearer was making distress signals—amazement written on every feature of his face. "How is this thing a city?" he asked.

The stranger stared; then frowned. After a moment's silence she smiled again and nodded her head.

"Some of our research historians have held that you did not understand your own institutions," she said. "Most of us thought that rather a far-fetched idea. But evidently it is perfectly true." She looked hard at Winters. "I find it remarkable to think upon," she said.

"What then is a city? A place for houses to collect people? Not at all. It is a machine—a complex thing, almost alive in the animal sense of the word. Power is radiated on copper nerves—water travels through underground arteries—food passes through the kitchens and is cooked and travels to the proper citizen needing sustenance. Telephone and television connect the separate units into a whole—even as nerves. This is a city in its broader aspect, is it not?"

"I suppose you could look at it that way," replied Winters.

"And then the specialized services of a city! They are a million-fold: My own city is not the latest model, but," she glanced about her with some pride, "I venture to say that not even under the Brain were there so many conveniences to hand in a city. First comes a complete power, food, water and sewage system. The food is all synthetic, of course, and a small reserve supply is stored in the remote event of machinery trouble. Clothes, writing materials, chemicals, and such articles as are consumed from time to time, are provided in continuous supply by tiny factory units. Permanent articles are made quite indestructible. I have no wish that a button will not satisfy! And in addition my city can travel through the air, over the ground or—if I should wish—even over the surface of the water!"

"But how is this possible? You press a button and—then what?"

"Really! How childish! You understand that from any raw material the automatic chemist produces any desired combination of elements?"

Winters nodded doubtfully. Something of this sort had been developed five thousand years before, but not quite so sweeping in scope, as he remembered.

"Then what could be simpler? The intake feed sucks whatever material is in contact—water, air, earth, no matter—and the buttons control the nature of the finished product."

"And the power?" asked Winters in some confusion of mind.

The woman stared. "Surely atomic motors are ancient enough in the world even for *you!*" she said and there followed a moment's silence.

"I am a historian," she added, half to herself. "I imagined it might be interesting to see you—but I was mistaken."

"But so am I a historian," put in Winters.

She shook her head and smiled. "A historian is of value only as he can translate the past in terms of the present. You are history itself and must be explained by historians—but I am afraid we have overestimated the

mental ability of you ancients!" and there was another silence lasting a full minute.

"And what do you do for company—I see you are all alone."

The stranger stared and the dark face flushed darker yet.

"Company! Are you sane? That is the greatest boon of all! A person can get off by him or herself and live in peace and comfort without being under the necessity of having other people around!"

"But—don't you like other people?"

"I see that you do not know the rudiments of values in life! In your day you were compelled to go to other people for food, clothing, housing and in fact everything you needed. Nowadays we do not have to do so. In your day you made a fiction of preferring crowded streets. But such a liking is not natural to the human animal and we have cast off that pretence."

"Do you not have husbands and wives?"

"Of course. Such things are for the children. When we become adult we leave childish pleasures and come out into the world."

Winters puzzled over this reply a minute and was startled when the great "city-machine" suddenly lifted itself into the air and started away over the trees. He was still wondering when a great steel cable wrapped itself gently around his body and swung him, struggling, a thousand feet into the air and set him down on a narrow platform at the very top of the structure. A door opened and the metal tentacle gave him a push which sent him sprawling on the floor inside, while the door clanged to, behind him.

It was a few seconds before he recovered sufficiently to stand up and look around him. He was in a steel vault with domed roof. The room was easily forty feet from wall to wall and circular in shape. At the other end of the room a long couch ran for twenty feet beside the wall and beside this, staring wildly at him were three women.

He started to walk toward them when a heavy, snarling voice spoke from the ceiling.

"Stay where you are, Winters!"

He looked up and observed at the very apex of the dome a sort of ventilator with a seat slung beneath it. In the seat sat a huge man, broad of girth and with huge shoulders and long arms. He was peering through the observation slits and muttering to himself. Suddenly he reached for a lever and pulled it back with one hand. There was a hiss and a droning hum of some motor starting up beneath Winter's feet. Then Hargry lowered himself, seat and all, on the end of a cable—for all the world like a spider on a line—and stood peering at Winters with keen eyes. His legs were short and the great hands opened and closed convulsively.

"So you have lived for thousands of years and came to look us over! What do you think of us? The ant comes to criticize the elephants!" and he laughed boomingly.

"I do not understand what it is all about," replied Winters bravely. "I am a scientist. I have come to spend a few days studying your civilization and I find savagery instead. What will you do with me?"

"First, of course, I want to use you for breeding. After that . . . I think I'll take a look at your insides in the name of science. Just now, however, you are a nuisance. I have to be half a world away by tomorrow to attend to some experiments and I don't quite know what to do with you, Winters."

"How do you know my name—that is the second time you have used it!"

"Nothing simpler. Your entire story is part of our racial history. It is written that you went to sleep five thousand years ago and we have been expecting you to awaken for the past month . . . but I have no more time to listen to your childish conversation. We are near the city of the abgene and I shall leave you there with him until I return. That should be safe enough."

CHAPTER II
The City of Mirrors

With a curt nod he pressed a button and was lifted rapidly up to his seat under the dome and Winters felt the platform shake and roll beneath him as the huge structure made its rapid way over the ground. After half an hour the floor ceased its sickening lurching and the steel door flew open. Winters gazed at it fascinatedly and there entered—the cable-like tentacle! With a cry he sprang away, but the steel coil whipped itself around him like lightning and he was drawn out of the door and lowered giddily to the ground far beneath.

He stood on a small slope and before him rose the walls of a city. They were about fifty feet in height and perhaps a quarter of a mile long—silver gray with the sheen of some metal worked into the very stone of the structure. The tentacle had released him, but rested on the ground behind, as though to prevent his escape. He stood, puzzled what to do, when a huge booming roar came down to him from the skies:

"Enter the city, Winters!"

There seemed no opening, however, and hesitantly he proceeded to walk along the side of the wall in the meadow grass that grew there and after he had half circumnavigated the walls he came upon a square hewn archway. The metal tentacle, meanwhile, had kept pace with him, slipping over the ground like a huge snake, and now it moved up, forcing him toward the opening. The whole scene was so unutterable lonely and desolate that he shuddered and thought desperately of attempting escape, but finally stepped upon the threshold. Once more the great voice came to him from above:

"Push open the door, Winters!"

He found it gave to his touch and before him stretched—an empty corridor! He stepped inside and immediately the door banged to, behind him, nor would it open again. He was a prisoner! With sweat starting on his forehead, Winters walked down the corridor and turned the corner. Then he stopped, breathless. Before him stretched, row on row, thousands of men in orderly lines. Each man was looking straight at him with a smile of welcome. But the startling fact was that Winters could not tell one of them apart—they were absolutely identical in dress and appearance!

He cleared his throat nervously. "Who are you? What city is this?" he asked.

Ten thousand arms thrust out in a gesture and they all answered in unison, like a well-trained chorus: "Our name is Mankind."

This was not precisely illuminating to poor Winters. He walked a step or two forward and fresh vistas of men sprang into view and not until then did he notice something—he was separated from the inhabitants of

the city by glass walls. He put his hand out and touched one of them and stared curiously at the figure behind it. There was something slightly unreal about the grotesque affair. Surely those sheets of glass could not be some kind of *mirror*?

"Why are you all alike?" he ventured to ask.

The images in the glassy corridors drew themselves up proudly. Their voices blended into one—a hoarse, heavy crowd-mutter:

"There can be only one Perfect Man. We are replicas of Him. There are no inferiors in our City!"

Then, thought Winters, these *are* mirrors. But, and it struck him with sudden horror, the mirrors did not reflect himself but only the citizens. Was he nonexistent—a dream? Dim mysterious corridors stretched in all directions under the clear white light—stretched to insanity. Ten thousand eyes stared coldly at him; ten thousand lips opened and ten thousand voices spoke:

"In our search for Utopia we sought the one best type. We found it. All other types were suppressed. But there remained then only one man in the country, so these mirrors were invented. They reflect perfectly the shape and voice and even the thought of the Original—but nothing else will they reflect. We produced ten thousand citizens. We could have produced actual men by careful breeding, but what good would have resulted? They should all be identical with the Original, anyway, or else be less than perfect. They would all have looked, thought and acted in the same way. Besides, there would have been a waste of food and labor. So we use the image instead of the reality. If more citizens are needed we will build more mirrors. If there is overpopulation we remove some."

"But—but—is one of you the Original then? Which one is he?"

The mirror-men looked shocked in unison. They spoke all together.

"He is not here. Perhaps He is behind the mirrors. Some of us have claimed to be He—many of us have claimed that from time to time. But we do not believe any such. We know that we are made in His image, but—we do not talk about Him."

Winters walked nervously down a corridor and then stopped again. What could be more fruitless than to go further into such a city? One thing, however, puzzled him.

"How is it," he asked, "that you know my name and speak what must be to you archaic English?"

"Your history, Winters, has been taught in the City of Youth for centuries and Old English, as it was spoken in the days of your own youth, has been a popular study for the past twenty years in preparation for your return."

The answer was in unison, ten thousand words and gestures were uttered in absolutely precise identity. Winters' body had not yet fully recovered from his long coma under the earth and his nerves were becoming jumpy.

"I must see the real man," he cried irritably. "The rest of you are phantoms! Let me out of this accursed place!" He waved his arm wildly and turned to retrace his steps. But now it was hard to tell which corridor was glass and which real and he bumped against a transparent wall and rebounded to another. Angrily ten thousand men stepped forward and in an agony of horror and dread he rushed at random from mirror to mirror battering his body against unyielding glass when he least expected and finding his progress unobstructed just when he extended an exploratory hand. The city reeled about him and he fell to the floor. Everything became dark in his head and he remembered no more.

It must have been an hour later that he awoke and sat up dizzily. The mirage inhabitants had all vanished now and the corridors were dimly lighted, so that it was possible for Winters to determine which was passage and which reflection. He rose to his feet and, feeling hungry, chewed some concentrated food tablets from his pocket, as he wandered down the hallway. Which direction led to the door and which away from it he could not tell. Had he reached the door, he knew that it was locked, but he wandered on in search of it as men will whose position is hopeless and to whom activity offers at least the appearance of accomplishment. Step after step, hour after hour he wandered, turning and twisting among the corridors—now and again trying the glass walls to see if, perhaps, one might prove a door.

● In his belt, under the leather tunic, were a few simple tools—a saw, a file and a small axe. In reckless desperation he pulled out the axe and sent it crashing into a great mirror. A cascade of broken glass fell to his feet and he stood gazing into a swiftly narrowing cabinet, which turned downward like the throat of a phonograph horn and a hole led through the floor level into blackness. Several stout cables led down this from three complicated looking pieces of apparatus that had been set just behind the broken glass. Perhaps, Winters mused, he might climb down to whatever lay below by clinging to these cables. As he stood there, the lights flashed bright once more in the corridor and all around him stood the thousands of reflected figures.

"You have passed beyond the surface of existence," came the massed voice. "You have killed a citizen of our city!" and Winters, not knowing what might follow, entered the shallow cabinet and climbed down the throat of the opening.

It was dark down there and the shaft was a narrow one, but he had scarcely descended a dozen feet before he touched ground beneath and felt himself free of the enclosing walls. A little light came down from above and as his eyes became accustomed to the gloom he perceived that he was in a huge cellar, extending into the murky darkness on all sides and with supporting pillars set every ten feet or so. Presently he thought he could make out a tiny crack of light far off to one side and set off in that direction, cautiously feeling his way among the pillars. As he got close to the spot there could no longer be any doubt. Light was coming through a crack in the wall! Stealthily he applied his eye to the opening and looked through.

He could make out the far side of a room. The walls were of reddish brown and a chair was set against it and a strip of blue carpet was visible on the floor. As he stood there he heard a voice inside the room speak, and a faint rumble, in unison from overhead, made Winters start violently.

"Come up again, Winters! There is nothing but sorrow to be found behind the scenes of Life!"

Here then lived the Original! Winters was getting ready to withdraw in fear and trembling, when a shadow fell on the wall and into his zone of sight passed a small

inoffensive looking man. He paced nervously to and fro, wringing his hands. Winters could hear him mutter to himself: "Oh, he'll find me out! He'll find me and kill me! What shall I do?"

And Winters laughed silently to himself as the full humor of his discovery came upon him. He spoke softly through the crack and saw the little man start back terror-stricken.

"I mean you no harm. I am a captive here and if you will help me escape I will not touch you. Let me into your room!"

"How do I know you won't hurt me if I do?"

"Why should I hurt you? If you don't let me in I will break the wall!" (This last was pure bluff, for the wall was of stonework.)

Through the crack he could see the little man standing in perplexity. He made a step towards Winters and then stopped. Winters thereupon drew his axe and struck the wall a few noisy blows.

"Stop! Stop! I will let you in!"

Abruptly a square of light appeared in the wall beside him and Winters passed through into the room. The two figures stood a moment eyeing each other doubtfully. The little man licked his lips nervously.

"So you are Winters! But how terribly different from a man you look! Almost like an . . . *animal*! You have teeth! And your skin is white like the belly of a fish, not like a brown human face at all!" And as if these differences made him somehow superior, he drew himself up proudly and disdainfully.

Winters laughed. Curiously he looked about the room, but except for one end it was in no way unusual. At the far end of the room, however, were set two motors and a maze of wires led into three complex mechanisms set at about eye-level on the wall. The man himself was perhaps five and a half feet in height and quite slight in build. His dark face rose to an enormous intellectual forehead, but the eyes held a weird expression and the mouth was nervously twisted to one side.

"Why do you live here and what purpose do those mirrors serve, up above?"

At the question all the stiffness seemed to go out of the man's backbone and he became once more the cringing figure he had been.

"I am Hargry's captive! Many years ago he put me here and gave me those mirrors . . . to amuse me, he said. And you, of course, are his captive as well?"

"I suppose so," said Winters, "but I don't propose to remain so!"

The dark eyes peered at him quickly. "But if you escaped—where would you go? Hargry would search the world over for you and . . . you would be very sorry for yourself when he caught you!"

"You know my history?" (The man nodded.) "Well, then, if I escaped I should get back to my city and down into my lead-lined chamber far beneath the earth. Hargry would never find me and when I awoke again he would have been dead and buried for thousands of years!"

A sudden thought seemed to strike his host like a blow.

"But—then so could I!" Sudden hope lit the drawn face. "Escape!—It is possible at last—at last!"

"It would be a simple matter to get out of here," he continued, "for I solved the problem years ago. I have dug a tunnel under the city wall that needs only a strong push to open through the clumps of bushes on the slope outside. But I never dared to use it. . . . Hargry visits me once in a while. . . ." He stopped, shuddering.

"Hargry will not return for several days," said Winters.

"Then . . . yes . . . we will do it!" The little man seemed to be nerving himself up to a pitch of enthusiasm. "We must rest ourselves and make all preparations and then . . . ah! . . . out we go and away as fast as we can!"

"Good! What is your name?"

"I am Bengue. Years ago," he drew himself up to his full height, "my name was not unknown in the world as a biologist. I bred men of genius and . . . one of them was Hargry! I was proud of him at first but I had made him ruthless and purposeful and before he was eighteen I had lost all control over him. He went off into the world. You see, Winters, I am not normal, altogether—I liked a certain amount of company. To be entirely alone makes me nervous and . . . you have seen me after twelve years of loneliness! I am not always sane. . . ."

He stopped and stared broodingly at the floor. "Hargry came back to visit me after a year's absence and we had words . . . he was a true individualist, as is most of the world today, and I am an abgene in that respect. If I had not been the scientist that bred him, he would have destroyed me on the spot—all over a passing difference of opinion during a conversation. As it was, he brought me here and built this city. The mirrors are supposed to make me feel that I have plenty of company!" His voice dropped to a whisper, *"Sometimes I do feel that way about them!"*

"I merely ventured to regret the modern tendency to live alone and without any human intercourse. . . . I believe I said that an occasional exchange of ideas would benefit everyone concerned." There was a short, bitter laugh. "As I bred Hargry, so is he! Great intelligence, but greater will-power. He took my words as a criticism of his actions . . . and so they were!—but you are hungry perhaps?"

● Bengue went over to the mechanical end of the room and drew from a closed chamber two pieces of whitish food which he and Winters ate. It was almost identical with the "ambrosia" Winters had tasted five thousand years before—that food which the science of that day had pronounced the perfect sustenance for the human animal. It was delicious and the broad couch which Bengue offered him proved soft and luxurious. He was asleep in ten seconds.

He awoke many hours later in the grip of a vivid nightmare and sat up, dripping with sweat. Bengue had heard him wake and had turned on a light to see what was the matter. "It will be dawn in another half hour . . . I have not seen dawn now for many years. Since we are wide awake, we may as well start upon our escape." His eyes were shining with excitement and his cheeks flushed.

Accordingly they filled their pockets with large cakes of the artificial food and Bengue took a small electric torch from a shelf and led the way into the dark cellar full of pillars. They proceeded along the wall for a hundred yards and then the light flashed upon a black

hole in the masonry. Into this he led the way and, on hands and knees, the two fugitives traveled a hundred feet of tunnel, Winters in the rear. At last Bengue stopped and made room for Winters beside him.

"Here we are," he said. "Feel these roots overhead? All we have to do is push them up and we are free."

Together they set their backs to the task and after a breathless minute their heads and shoulders emerged together at the top of the short slope leading down to the walls of the Mirror City. It was still dark, but the stars were pale in the sky and over to the east a little hint of yellow gilded a vapory cloud bank. It seemed cool and Winters shivered involuntarily.

"Where now?" he panted, as they struggled up to the surface of the ground.

"The City of the Exodus lies about twenty miles due north of here. We have no means of getting there except by walking."

Winters grunted. It should be possible to make it by nightfall, he thought. They set off across country, keeping as much as possible under the shelter of the semi-tropical woods. After the first half hour this semi-jungle became broken irregularly by open glades and in the second glade they came to, rested one of the great living machines. It was just beginning to grow light and the sun's rays touched the very tops of the trees. Cautiously they skirted the opening and plunged on among the low growth of greenery—up hill now. At the end of the second hour they had covered perhaps six miles and paused at the top of a hill to rest a moment. Winters lay flat on his back while Bengue moved nervously about, peering through some branches at the country behind and below them. Suddenly Winters heard his companion utter a sharp exclamation and he sat up to see what was happening.

On the horizon to the south he made out the great skeleton-figure of Hargry striding along outlined against the sky!

It must not be thought that the high-handed action of Hargry in laying claim to Winters had been taken tamely by the biologists and breeders of the world. A dozen or more of them had already visited the ruined City of the Exodus and had seen his grandiloquent notice posted there and the story of the deaths of Meanus and Valendum had been broadcast and some thirty scientists had climbed into airships of one sort or another and set off to find Hargry and wrest Winters away from him, each for his own ends. Had they been unified in a common purpose, of course, they would have had no difficulty whatsoever. But Stakool, from across the ocean, had run across Pylgrin from the West Coast and, the two being firm enemies, they set upon each other then and there and fought it out. As a result only twenty-eight airships—three of them cumbrous living machines—sighted the great form of Hargry as he strode over the hills.

Even as Winters looked, he saw one of the thousand-foot tentacles strike out at a busy black dot and presently made out the cloud of attackers against the brightening sky. Bengue was all for making instant retreat, but Winters insisted upon remaining.

"Suppose we do get another mile to the north—Hargry can make that up in fifteen steps. I want to see this fight!"

So they remained, Bengue wringing his hands in an agony of fear.

The ships seemed to attack one by one and presently Winters, to his amazement, observed three of them circle away *fighting each other!* The spectacle lasted altogether half an hour and Winters' surprise and horror increased every minute of it.

"But why—*why*—don't they get together and all attack at once?"

"Why should they?"

"They want to kill Hargry, do they not?"

"Only so that they can get you—each for his own set of experiments, I imagine. Suppose they did kill Hargry—then they would have to kill each other until only one was left. He would search for you and would be a gainer by the fight. There could be only one man victorious."

"How do you know this? Isn't it likely that they want to destroy Hargry for the sake of public peace?"

Bengue's eyes opened wide.

"What ancient nonsense is this! *Of course* they could not interfere with Hargry's personal liberty. Once started, where would such a principle stop? Oh, I see . . . in olden days people used to have things called laws, didn't they? Really, we aren't quite so primitive as that!"

"But why should they want to kill me in their laboratories? I have come here as an observer from the past. I shall go on into the future in the cause of science. What a mad world this is!"

Bengue tapped his foot impatiently. "Where you get the idea that you are qualified to criticize a world so far above you in development, I cannot imagine! Physically you are repulsively bestial—with your teeth and your white skin, covered with hairs like an ape. Mentally—well—you would never have passed alive out of my breeding jars! What makes you think your cause is so sacred?"

CHAPTER III
Hide-and-Seek

Winters was silent. Bengue's words were plausible, but he suspected a good deal of what he said was due rather to imaginary than to actual improvements in the human animal during the last twenty thousand years. But there was some truth in them . . . enough to put Winters in a gloomy state of mind. Had he forsaken his own times and his own kind of people all for the sake of finding himself an unwanted guest in a future world of super-men? And if so, why go on still further into the future? Might the steady progress of evolution not change the face of the earth in the next five thousand years—make him still more ludicrous in the sight of the still further improved humans who were to come?

Bengue was looking at him surlily.

"All very well," replied Winters stoutly. "Suppose you are right . . . I can still reason sanely. If you are all such super-men, then explain what you are trying to do with life!"

Bengue shrugged his shoulders. "I suppose you have some definite questions?"

"What does Hargry propose to accomplish?"

"To breed a more intelligent man than now exists."

"And your chemists?"

"Many things . . the heavy elements—radium and

beyond—have not yet been synthesized and thousands are working on that point."

"Ah!" exclaimed Winters, "that's more like it! Do they compare notes and help each other in the search?"

"What nonsense is this? Of course no one reveals his work to another!"

"There it is again! Of all the stupid irrational ways of doing things!"

"But what possible motive could there be for such cooperation?"

"Why, to get their job done and the information broadcast to the world!"

"How stupid! A man is entitled to fame and credit for his own discoveries, not for his ancestors'!"

"Well then, have you artists or musicians?"

"Oh yes, such creatures exist I suppose. But I am a scientist and know very little about them."

"In my day we would have called that attitude 'narrow-minded'—but let it pass. It is only in keeping with the rest of things. . . . Now answer this question if you can: How does it happen so many super-biologists are willing to drop their so-important work and fight each other for the possession of an ancient like myself?"

Bengue's eyes widened. "You are new blood for their experiments—that's all."

"Oh . . . I see. Yes, the biologists *would* be interested in that."

"Well, are there any more childish questions?"

"A thousand! Supposing your scientists succeed in all their tasks and you solve all nature's secrets and breed perfect men—what then?"

Bengue nodded condescendingly.

"All our children, sooner or later, ask that question. There just isn't any answer. A man is born and reaches adult age. Then for perhaps forty years he is free to do what he can. At the end of his allotted span he must die. The result is, of course, a certain aimlessness—but, after all, when a man is dead that's the end of him. What aim or purpose can there be after death?"

"And so all this fine striving . . ."

"Gets us nowhere. For thousands of years we have been working over the problem of prolonging human life. With good luck a man can live to be well over a hundred years of age—but his mental and physical vigor are gone at seventy. Of course there are the astronomers . . ."

"Why, what do they do?"

"Their task is at present to study the planets by telescope and by actual observation in rocket ships. A small colony has been established on Mars for the past two thousand years and many attempts have been made to colonize Venus—but it is too young a world yet. Poisonous fogs and violent earthquakes are constant and the hot steamy atmosphere is unfriendly to human life."

"But what is the purpose?"

"The earth will not remain habitable forever. They are preparing for eventualities. Of course what is really needed is a suitable planet circling a new sun—but the nearest probable star is two centuries of rocket travel away and there again our short life-span holds us back. However, our astronomers have a definite aim and purpose in life and, within reason, they exchange information and assist each other."

"And the rest of the world—goes mad," said Winters sadly. "Killing each other for the sake of a moment's whim . . . each pursuing his own ends and, no doubt, rediscovering again and again what has been already found and forgotten a thousand years ago. It is a mad world!"

"But we have—each man—his freedom!"

Winters eyed him quizzically beneath the bushy gray eyebrows and Bengue remembered Hargry in sudden panic.

"We shall separate," he said. "Hargry will pursue us and find us sooner or later. If I can get miles away from you so that he does not suspect that I helped you escape—he *may* not kill me when he finds me!" And without a word of apology he turned and set off at a furious pace westward, crashing through the underbrush as he went.

Winters stood there on the hill-top for ten minutes. He was just turning to make his hopeless way north when he heard, from miles away, a great crashing sound and observed against the clouds the form of Hargry. He was evidently making wreckage of the City of Mirrors. Winters started convulsively and set off through the woods as cautiously as he could. It was difficult to keep sure of his direction traveling entirely by the sun, and he shuddered to think of what might happen to him if he could not find the overgrown ruins for which he was searching. It was hot and sweat poured off him wetly and his breath came in tortured gasps, but still he pushed on—an ear alert for sounds of pursuit behind him. Twice he came upon clearings occupied by great living-machines and gave them a wide berth, circling round through the woods. By the middle of the afternoon he was exhausted utterly and sank down to the ground in the shelter of a dense thicket and fell sound asleep. He estimated that he had come fifteen miles since dawn.

● He awoke in the middle of the night, chilled and with every muscle aching. He forced himself to eat the food he had brought and drank from a flask. The sky was clear and the stars shone brightly. Polaris, friend of mariners, beckoned him north as of old, but he remembered that even the stars had changed and aimed his course partway between the ancient North Star and one of the bright points in the handle of the Great Dipper. It was bad enough walking by day, but at night he found himself unable to better a pace of a mile an hour and when he came to clearings, walked in them, close to the side of the forest.

Hour after hour passed and, trying to recollect the lay of the country around the ruined city, he began to fear he had lost his way. So he stopped and waited for daylight. At the first light he started forward again and so came, weary and worn, to the crest of a sharp ridge, clothed with green. On his left, across a broad clearing, was the white masonry and dusty purloins of his goal!

Thankfully he was about to start toward it, when something gave him pause. It was music! It came from the other side of the ridge. Cautiously he crept through the woods and peered out to see one of the living machines a few hundred feet from him. The music had ceased now and by the early light he made out a dark figure seated in it busily working over some papers. Curiously he waited and presently the figure straightened up and pulled something with one hand. Winters

always remembered that scene, not only because of its tragic aftermath, but for the sheer breath-taking wonder of sound that ensued.

The sun was just lifting above the eastern horizon and a few brilliant clouds floated above it like gorgeous galleons sailing in the ocean of sky. The heavy dark leaves of the palms that edged the clearing were motionless and the hills behind them showed faint and blue. The sound seemed to come from the hills at first—a faint far piping that was answered again nearer by. Then abruptly a triple crash of sonorous chords out of which a deep golden voice began to sob melodiously.

The song swelled in tone and developed its simple phrase into a theme of such tragic melancholy that a hundred small voices commenced piping as if in sympathy. Then once more the great stunning crash three times repeated and now with new and sinister meaning the harmony changed as deep basses lent new force to the old theme. Abruptly the music ceased—unfinished. There was a moment of silence broken by a voice.

"You like it?"

"Heavenly!" The answer was in a woman's voice. "Dulcgong has never done anything as good, Varlin. But Varlin . . . music is not the only pleasure! Look at me!"

Winters strained his eyes to see the speakers, and finally made out another form in the machine, half hidden behind the musician.

"No, don't pretend you are not interested! You are looking at Aphrila—the most beautiful woman in the world. Why do you turn away your head? Are my cheeks wrinkled or my hands hard to hold? Many men would give their lives to be in your position! Hargry came out of his fighting-tower when I visited him last year and used my circling arms for his protection during a whole mad week!"

"Don't, Aphrila! You are very beautiful—but I want to work on my music. I can't think properly when you are acting this way."

"Oh! I bother you? I at least make some impression—I distract you from your work! Music is beautiful, Varlin—but have you ever eaten food prepared by Escule? Do you know what it is to drink the liquors invented by Vint or by that great artist Grumbaugh? Come with me and I will give you all these and more! You will come back from such an experience with renewed youth and vigor and will write music greater than you have ever dreamed!"

Their voices became inaudible and Winters retreated cautiously, wondering more than ever about this mad world into which he had arisen. He crossed the narrow ridge under the trees and looked out at the great figure of Hargry striding toward him from the west! And now, like a panic-stricken animal, he scuttled back through the woods and stopped at the other side, heart beating like a trip-hammer and limbs trembling with fear and exhaustion. Presently he could hear the great thudding footsteps approaching and down from the left strode Hargry, to stop suddenly as he caught sight of the living machine.

Then the great structure advanced and the clumsy living-machine tried to rise and escape, but a tentacle whipped out and held it motionless, then lifted it slowly halfway up to Hargry's steel chamber at the top.

"Why, it's Hargry! Is this any way to treat Aphrila?"

There was a short silence, and then Hargry's voice boomed out in laughter. "And who is Aphrila's friend?"

"You *were* not long ago, Hargry!"

"I have no time for memories, woman! Who is he?" . . .

As if in answer, a great chord of music sounded—so deep and rich as to set the air trembling and the leaves rustling on the trees. For a startled instant Winters thought the sky turned brown and felt his limbs tremble. The sound ceased and he looked to see the tentacle set the machine and its occupants down again, none too gently, and the tripodal monster set off again northward and out of sight.

Evidently Aphrila and her musician were badly shaken, for it was five minutes before the clumsy machine rose into the air and soared off in panic-stricken flight to the south.

Winters tried to imagine the part of the story left unrevealed and found it hard to picture the life and activity of the human race from the fragments he had been privileged to observe. The first woman he had talked to spoke of sex matters as things for children. Yet here was a woman who evidently devoted her life to the art of love-making—and Hargry, an earnest, almost fanatical, biologist, willing to amuse himself with her.

What a jumble of interests—all conflicting—did the world present! Each person followed his particular whim or desire to its ultimate end with a fine disregard for the interests—even the lives—of all others whatsoever. And yet in the midst of anarchy there seemed to be some orderly progress in this line of research and that. Could it be that anarchy was a desirable thing? Winters, thinking back over the past twenty thousand years of human history, decided not. What had happened, he felt, was a cycle in government. There had been far too much under the Brain. Now the pendulum had swung the other way and there was far too little. Somewhere between the two extremes lay the truth and after a few more thousands of years it would be found there and recognized.

● But his own immediate problem was still unsolved.

This world was not for him and he must get back to his subterranean chamber and await a better one. Yet how could he cross a half mile of dusty plain to the white ruins that showed against the green forest to the north? Far to the left the great form of Hargry's fighting machine showed, like the naked tower of some twentieth-century suspension bridge. Winters lay in the concealment of the shrubbery and waited impatiently. Hours passed and Hargry still strode about the landscape. It began to look as though he intended to remain until he had found Winters! And yet, thought Winters, when night falls surely I can slip down to the plain and across it unseen!

He was growing hungry and had no food left and nothing with which to slake his mounting thirst. At dusk he carefully observed his directions and so soon as darkness set in he slipped down the hill and started across the level. He had gone halfway before the searchlight started to play over the plain. The first stab of light coming from Hargry's thousand-foot tower startled

Winters almost out of his senses. Should he retreat or keep on? But there was no real choice—he *had* to reach the ruins.

He stumbled forward at a run and the chill of fear gave his limbs surprising new strength. Hargry was approaching now, and the light swept the ground behind him in a long swath. On ran Winters, hoping desperately against hope. Then the light became steadily fixed upon the plain close to the ridge he had just left and Winters had a two minute period of grace. He could see the first of the ruined walls just ahead of him now. But the searchlight was coming slowly toward him, as though Hargry were following something—as he was, for through his telescope he studied the tracks Winters had made as readily as though he were stooping over them in person. Just as Winters reached the ruins the light caught up with him and he could not resist a terrified glance over his shoulder at the great white eye that glared balefully out of the darkness and that grew larger each second as Hargry's great strides bore him nearer.

With a cry Winters darted up a side street, into the friendly darkness. He knew where he was—he had to reach the other side of the central square. The distance was perhaps two hundred yards. Should he make straight for it? Or should he attempt to hide and slip stealthily—a short dash at a time—as opportunity might serve? When he came to the first cross street he stopped, for the light lay blindingly upon it. If he crossed he would guide his pursuer toward his ultimate hiding place and, Winters realized, he had not only to reach safety but do so unseen, or he would be dug out and made captive again.

He slipped into the house on the corner. The door was non-existent and little more than one room remained intact of the original structure. At the window on the cross street he waited breathlessly. If the light moved away for two minutes he could cross unseen and . . . there! It had gone! Like a flash he climbed over the window sill and darted across and into the house on the other side. Then the light swept by once more—almost overhead now—and a great crashing told of Hargry's huge feet trampling the buildings to the ground.

And now began a grim game of hide-and-seek. Hargry was evidently determined to smash the entire city to the ground and thus destroy all hiding-places. Winters thought a breathless moment and then slipped out from the rear of the house and made his way unseen to the great circular avenue that surrounded the ancient city. If he could only do it in time! He was protected from the searchlight, provided he hugged the buildings, and ran panting along until he came to the section of the city in which Eric's house had stood.

The dust of fallen masonry was rising like a white cloud now and it was this that really enabled him to make his final dash along a lane and past the very foot of Hargry into the doorway he remembered. As he did so a great crash arose outside and the front of the house fell out. But Winters was in the back room by now and pressing his foot on the release mechanism, which seemed to take an eternity to operate, though actually three seconds only elapsed before the heavy stone flag rose and he could plunge down into the darkness of the stairs.

He frantically pulled the lever and breathed a sigh of relief as the stone started to sink over the entrance. But Hargry placed a foot upon the building at that time and with a crash it sank beneath that ponderous weight and sealed the trembling fugitive beneath a layer of wreckage.

For an hour Hargry tramped furiously over the ruins until no stone was left standing upon another in all that city. Then, as if he realized the hopelessness of the task, the light flicked out and the great structure commenced striding southward, the sonorous booming of the great feet growing fainter and fainter in the distance until the stars looked down upon the quiet night and the dust settled in a white layer upon everything and gave it a ghostly look.

Beneath the city the lights shone in a small chamber. Winters had been hurt by a falling stone and spent half an hour dressing his bruised leg. Then he took food and medicine and slept fitfully for a few hours before he made final preparations for his long hibernation. He closed the great metal door, set the radium clock to arouse him after five thousand years should have passed, inspected and adjusted the tiny atomic motor that would keep the chamber warm and provide power for the lights that were to awaken him, and took his drug.

Then in the half hour of consciousness yet remaining to him, Winters opened a heavy book, with leaves of thin sheet gold. In this he made the following fragmentary entries of facts gleaned chiefly from Bengue:

15,100 A. D.—Perfection of exogenesis. Human embryos successfully developed in test tubes. From here dates the dropping of the last link between mankind and the animal emotions.

17,500 A. D.—Test colony set up on Mars. Still maintained.

18,000 A. D.—Perfection of materials machine—any chemical substances produced at will from any given raw material.
From this period commences, roughly, a general tendency toward the gratification of the individual will or ambition regardless of consequences. Tendency still dominant. History ceases to have significance to the race—a mere record of individual actions and achievements.

20,000 A. D.—Winters' fourth awakening.

Winters read the words over carefully and sighed at their brevity and the extreme paucity of information available to him. But it was the best he could do and he closed the book and set it carefully away before he stretched himself out on the couch, adjusted the stimulant tube over his mouth and plunged the chamber into darkness.

And while he slept, to wind up all threads of this necessarily rambling narrative, a slight and fearful Bengue was gazing hungrily from the shelter of the forest upon the breeding establishment of the late Meanus. For a day and a night he had been watching it and finally, taking bravery from desperation, had marched boldly up and found it a very biologist's paradise of equipment. Young Bork and Farinda had rather hesitantly handed over control to the elderly stranger and Bengue spent a whole hour without once thinking of Hargry.

Then he remembered and rushed fearfully out-of-doors and stood a minute listening, but heard no sound.

He shrewdly suspected that Meanus might have been one of Hargry's recent victims in the late unpleasantness and after a week or two came to look upon the place as his own. But he never got over the feeling that his present freedom was a temporary thing—to be ended whenever the inevitable ultimate Hargry should sound boomingly on the horizon. Meanwhile Bengue bred humans and enjoyed himself hugely.

Years later the suspense of waiting Hargry's arrival became unendurable and he began venturing upon short scouting trips in an airship, but did not happen to come upon his former pupil. Bork, moreover, was becoming difficult to control and Bengue decided upon a curious course of action. In the back of his head had stuck firmly the words of Winters, uttered long ago: "When I awake Hargry will have been dead for thousands of years!" So one day he called Bork to him and made him a present of the establishment, leaving at once in his airship.

He flew to a secluded valley and set his atomic motor to digging a tunnel and preparing a lead-lined chamber. In the course of a few days airship and man had disappeared and were never seen again. Thus it came about that two sleepers waited the passing of the centuries until the appointed hour should release them; and on the swarthy face of Bengue rested a smile of peace and security such as he had not experienced in many weary years. There was a hint of triumph in it, too.

THE END

Power from Cold

● A PARADOX, it would seem; but nevertheless the idea is seriously proposed to develop the natural power of the Arctic regions, with apparatus much less expensive than the mirrors intended to concentrate the solar heat of the tropics.

Other articles that will interest you, such as "Outdoor Living—Indoors," discussing the radiation-equipped home of the future; "How Much is a Million?" an exercise in visualization; "The Vacuum Dirigible," heavier-than-air and stronger than the gas-filled craft of today; "Where is All the Money?" a discussion of the gold problem and its implications; etc., are contained in the current (June) number of

Everyday Science and Mechanics

NOW ON ALL NEWSSTANDS.

What is Your Science Knowledge?

Test Yourself by this Questionnaire

1. Why can we see only one side of our moon? (Page 20)
2. What is the theory as to the shape of the moon? (Page 20)
3. What is the formula to determine how far a body will fall under gravity in a given time? (Page 21)
4. Does light really penetrate opaque substances? (Page 31)
5. What are the atomic weights of gold and tin? (Page 34)
6. What is black writing ink made of? (Page 37)
7. On what planet is gravity so fierce that a man could hardly move? (Page 41)
8. Where are the asteroids? What is their physical condition? (Page 73)

(Illustration by Paul)

Stooping he grasped the life boat, raised it to his chest and pushed it away from him forcefully. Before it passed out of view a ghastly white face appeared in the glass bulge.

MURDER ON THE ASTEROID

By EANDO BINDER

● In the dim interior of an ether boat, two men labored over a pile of rock lumps. They were dressed warmly in sweaters and thick skin-tight trousers. The inner sections of an ether boat were hard to keep warm, especially when the vacuum locks to the outside were used frequently. Every time the lock was opened and the air rushed out, the new air that filled the space when the outer door closed absorbed the intense frigidity of the bare metal wall of the lock chamber. Then, when the inner door to the boat proper was opened, this frosted air swept in and quickly lowered the average temperature. It was all the electric heaters could do to keep the heat up to just past the freezing point of water.

Consequently, the hands of these two men were blue and lined with white and sometimes red where the sharp stones brazed the skin. Their faces were red and puckered, not only from the coolness they constantly lived in, but also by reason of the many times they had ventured out in vacuum suits. The constant use of these suits was influential in promoting skin troubles and stomach disorders, for they were the acme of stale, uncomfortable, unhealthy confinement. These men used them often.

But despite their raw, bleeding hands, their sore faces, their frost-bitten skin, and their general ill health, they worked at the stone pile with unmindful eagerness. Each would pick up a rock, turn it over and over in his hands, and examine its surface minutely with a magnifying lens. Then he would put the rock in a steel mortar and pound it with a heavy leaden-weighted pestle till it was pea size or at least broken into smaller lumps. These remains would be fingered and looked over minutely and then thrown away with a gesture of disappointment or sometimes with an audible grunt of disgust. All the discards went in the same place—a big aluminum tub. Because of the low gravity, the material would float rather than drop, into the container.

The two men constituted a picture of contrast. The one was stout and paunched, fat of face with little piggish eyes that looked over the ore samples with obvious avariciousness. The frown on his smudged forehead and the downward turn of his mouth increased as the unexamined pile grew smaller and the discard larger.

The other man was slight of build and trembled with a constant ague that was a result of his strenuous and unhealthy labors and habits. A pair of weak watery eyes topped a bright nose that bespoke of his love for the wine-cup. His lips were thin and bloodless. At times he would furtively glance at his companion as the frown deepened, as if afraid of that individual's reaction to the disappointment in the batch of hard won but worthless rock.

● Mr. Binder is to be congratulated for one thing, even if for no other. He has written of the dangers and difficulties of space navigation and exploration with such careful detail that the story springs into life on every page. It is not one of those vague, rambling stories in which the reader must take space travel for granted and be contented with very general descriptions. For in those stories the reader forgets what he reads; he gets no clearcut picture of "what it is all about."

So congratulations, Mr. Binder, and come again with more such realistic, colorful tales. We believe our readers are hungry for them.

Finally Egard Hanson, the stout man, tossed away the ground remains of the last rock with an exclamation of anger and disgust. He looked at his companion whose watery eyes were dull with disappointment, and spat noisily into the aluminum tub.

"A fine mess of rotten filth!" he expressed himself. "Not the slightest sign of anything worth looking for. Not even an atom of silver or gold. Worse yet, no precious stones, not even little ones. Nothing but rot —filthy rot!"

The red-nosed individual pulled a kerchief from his hind pocket and wiped his watery eyes with trembling hands. He blew his nose sonorously.

"A month's back-breaking, freezing, blistering work gone up in nothing," continued Hanson petulantly. "Look at my hands—cracked and sore. My skin—it's burning up and every bone in my body is aching and jingling. And what have I got out of it? Nothing but a worthless dirt heap, just a lot of . . . "

He finished up with a whirl of invectives and epithets, his voice climbing from peevishness to snarling rage.

Jeremiah Timothy, the smaller man, said not a word but kept an eye on Hanson. Seeing his mood of disappointed anger wax mightily, Timothy carefully arose from the three-legged stool and ambled toward the back of the boat on his unsteady legs, hardly able to keep his balance because of the light gravity.

Hanson's enraged bellow stopped him. "Where in hell you going?"

"Why, I just . . . I just thought I'd have a little drink. My . . . my throat is a little parched from that dust . . . I . . . "

But Timothy did not continue on the way aft. He turned half sideways so that he could observe Hanson from the corner of his eyes. He was afraid of Hanson and would not dare get that drink of liquor unless Hanson remained silent or grunted in permission. But Han-

son did not give that grunt that the little man waited to hear.

"Timothy, come here and sit down."

Rubbing a sore red nose with the back of his hand, Timothy hurriedly complied with the command. After a wistful, longing look at the cupboard on the back wall, he turned his face towards Hanson. But his eyes avoided those of the frowning, angered man.

"Listen, Timothy," began Hanson in a voice that crawled with suppressed bestial rage. "Listen—nine months ago I picked you up. You were in Port Monto on Mars in the riff-raff part of town. There you were sitting at a table with a bottle of liquor half empty in front of you, as drunk as you could be. You were so drunk that part of your liquor was running across the table, curling up the varnish, and dripping to the floor. God, but you were drunk!"

Timothy had been drunk, he knew, but Hanson was just rubbing it in.

Hanson went on: "I came up. I had just come back from Jupiter where our gang went to collect a fortune in jewels, as that rotten liar of a promoter said. Well, I came back from that plenty disgusted and about a thousand dollars losers. I couldn't prosecute, or, by Heaven, I would have run that sneak of a promoter off the face of the planet. Stones, he said—big, shining, priceless jewels—just pick 'em off the ground on one of those damned moons of Jupiter. That's what he told us and like fish we bit, paid into a kitty, and bought the boat and 'treasure map' from this scoundrel of a promoter. We left ten men up there at Jupiter and nearly got lost at that, the whole bunch of us.

"You know what I felt like, Timothy, when I got back to Mars? I felt like taking somebody's neck and twisting and twisting . . . "

● Hanson, with a ferocious snarl on his fat face, placed his two hands as if choking a person, and twisted them viciously as he spoke.

Timothy got a little pale as he saw his companion working into such a towering rage. His red nose shone like a beacon over the white skin.

"That's how I felt," went on Hanson. "Like choking somebody. I always feel like choking somebody when I get real mad. Sometimes I did start choking somebody when I got mad but there would always be somebody around to pull me away. Anyway that was long ago, before I met you.

"So I met you in Port Monto in a dirty dive. I was still disgusted about the Jupiter deal and decided to drink it off. I happened to sit down at your table. You looked at me with those damned bleary eyes and it took you ten minutes to realize I was a human being. You looked at me at first like I was something in the way of your vision—like I was spots in your eyes. God, but you were drunk!"

The insults bothered Timothy not in the least. He had been insulted, kicked and spurned the better part of his life. He was used to it. He gradually began to breathe in relief, for Hanson was working off his rage, or so he figured.

"Then what happened?" thundered Hanson. "You know as well as I do. You began to talk like an eternal phonograph. Blab, blab, blab you went with all that liquor furnishing you with inspiration. I got disgusted and was going to move away to get out of range of your voice, when all of a sudden you said something about 'platinum on an asteroid.' Being a prospector myself, of course I pricked up my ears. I sat down again and tried to get some more out of you, but you were so filthy drunk I didn't know whether you were raving or not. But I decided to follow the lead, because you spoke in your drunken ramblings about a fabulous find of platinum ore that you knew about.

"I dragged you away from that dump and took you to my rooms and put you in my own bed. You were an awful bedfellow with that reeking breath of yours all over and your gurgling snores. I got up in the middle of the night to throw you out in the hall. I felt disgusted that I had brought you there just because you said a couple of words about platinum, words that any drunkard could say without knowing he said them. I grabbed you but just as I did that you muttered that phrase again about 'platinum on an asteroid' and 'I know where it is' in your sleep and that got me started all over again. So I stayed up the rest of the night and let you sleep off your liquor. I decided to find out what you meant.

"In the morning I made you take a cold shower and took you out for a long walk and a warm breakfast before you showed any signs of being normal. Then you began to talk more like a man should—but, by God, NOW I think you were still drunk then, because here we are and we haven't got a thimble-full of white metal or yellow metal or anything!"

Hanson stopped and glared accusingly at the other.

Timothy tried to stare back in righteous innocence, but he found it impossible. All he could muster up was a look of stubborn defiance.

"I wasn't drunk when I told you about that platinum, Hanson," he said in a mildly peevish voice. As his companion remained silent as if to hear what more he had to say, Timothy went on a little more confidently. "It's true, Hanson, every word of it. It's just like I told you. I went prospecting with four others in a ship that we pooled our money to buy. We scouted around six months and two of the fellows died. One ran out of oxygen and we found him suffocated to death in his vacuum suit. The other got a fever and died aboard the boat. It was the next asteroid after that. We picked up ore samples and the platinum ran through every one of them in gray streaks. We almost went crazy with joy. We stayed long enough to get the limits of the ore bed and took about a ton of rock aboard. I was the only one of the party that could figure the position of the asteroid—that's why they never let me do any dangerous prospecting—I was too important."

Hanson grunted sarcastically but let Timothy finish his story.

"Well, I figured the position, but something must have been wrong—either the asteroid slipped its orbit a bit or I made a mistake. You know these eyes of mine are kind of . . . "

"Don't say poor, 'cause they're rotten!" burst in Hanson. "No wonder you never found that asteroid again. I don't think you could recognize white metal if you saw it."

This stung the shrinking Timothy to a bit of spirit.

"I'll have you know, Hanson," he piped sharply to the other's surprise, "that they wouldn't have known

they had white metal if I hadn't been along. Why they brought in the stuff and swore at it because it didn't look good to them. I picked up some lumps and began to yell like a demon. It was a fortune in platinum.

"But," he sighed wearily, "when we came back with a government official who was going to plot the claim and enter it in legal records, we couldn't find the asteroid. My figures were off somehow. The official refused to stay and wait for us to search for it, so we had to go back. It took every cent we got from that ton of ore for fees and fuel and the rest. So there we were with nothing. The other two fellows began to quarrel the last evening we were together in a drink-shop and one of them stabbed the other to death. He was electrocuted. I'm the only one left of the five of us who saw that asteroid and saw the ore . . ."

"And damn it all, you'll never see it again, nor will I. What did I do after I believed you? I sold that land I had on earth and drew every cent I had and even that wasn't enough to finance this. I am ten thousand dollars in debt. Six months we've plugged away on these asteroids. Every time you said 'Ah, that's it! There it is—that's the asteroid, I remember that three-cornered rock,' we landed and broke our backs digging and chopping in the rocks. And what have we got for it? What have we got for it?" he roared at the wincing Timothy.

"Hanson, don't get wild . . . it isn't my fault. I told you before we started that we might never find it; that I knew only its approximate position because of that mistake in my figures. I told you that; how can you blame me?" whined Timothy, for he was getting frightened at the deadly sparkle in the other's eyes, the nervous clasping and unclasping of those pitifully lacerated hands.

"Timothy!" said Hanson. His voice was low, but pregnant with ominousness. "Timothy, we haven't got enough fuel left to do any more scouting around. We've got to go back to Mars. But back at Mars they've got a debt against me of ten thousand dollars. I have no way of getting that much money except working. It would take the rest of my life to pay it off."

Hanson looked dolefully at the aluminum tub filled with worthless rock, symbolizing the failure of their prospective venture. Timothy felt a cold panic arise in his heart. Something in Hanson's voice . . .

"So I've decided, Timothy," went on Hanson with that timbre of deadliness in his tone, "that there is no use my going back. Nor you coming back! I'm disappointed, disgusted, in debt, and . . . MAD! And Timothy, you remember what I said I liked to do when I was mad? I like to choke somebody . . ."

Timothy screamed in mortal fear as the burly Hanson, eyes hot coals of insanity, leaped at him. With unwonted, fear-produced agility, the little man evaded the grasping paws and jumped to the engine room, closing the door behind him.

● Prospecting for precious metals or for precious stones was one of the hardest and most dangerous occupations in the twenty-second century A.D. Any prospector, successful or bankrupt would tell you that if you got him to talk. And yet at the same time it was a fascinating pursuit and could be productive of enormous wealth. The reading matter of the time abounded with the life stories of famous fortune seekers who had come back from the reaches of outer space with the locations of wealth-reeking places.

Most of these finds were on the asteroids, those little world-like rocks that circle about the sun in between the orbits of Mars and Jupiter; some no bigger than a mountain; some a few hundred miles in greater diameter; all of them irregular in shape and totally barren of life. Such a thing as soil, sand, water or air was unknown on them. They were a personification of lifelessness.

But they were made of rock and rock often has embedded in it metals that are useful on the civilized worlds nearer the sun. Gold, silver, platinum, beryllium, copper, and various other metals were to be found. Then there were the precious stones—diamonds, rubies, emeralds, and even new ones that were unknown on other worlds. With such possibilities of treasure to lure the more adventurous of men, the asteroids had become a popular field of exploitation. By the thousands the fortune seekers left the inhabited worlds in their little ether boats and scouted snoopingly amongst those cold, airless rocks, seeking those waiting metals and jewels. The public news broadcasts would blare out periodically that so-and-so had returned from the asteroids and was now opulent with the pelf he had wrested from frigid space.

But it was as dangerous a pursuit as productive. Fully one half of the outgoing adventurers never were heard of again. There were enormous hazards in the venture. Whizzing meteors there were that pierced the ether boats to make them airless, frozen coffins for the occupants. Then it took high skill and a good smattering of celestial mechanics to guide the boats about amongst the asteroids. The prospectors had the ever-present danger of collision with one of them to worry about, for they were often but scant hundreds of miles apart, each with its own peculiar orbit.

One had to know what to do when one saw a gigantic rock with sharp crags and peaked spires rushing like a demon upon one in black space. The worst of it was that they reflected so little light. Only by the blocking out of stars in the field of vision could one distinguish them when near, for the distant sun—just a little red ruby amongst the pin-point stars—shed very little of his light that far away.

The process of landing on an asteroid was a story in itself. The pilot had to carefully swing the boat about so that he would parallel the motion of the particular asteroid he wished to visit. Then, by judicious rocket thrusts, he had to gently swing his boat nearer to the object until its feeble gravitation could grasp it and pull it downward like a feather. The pilot had to watch that his hull did not smash directly upon a needle-like spire of rock, or settle into a gully surrounded by elevations, for that would make it hard to get away again. An open stretch of fairly level rock was the ideal landing place.

Once happily landed, the real work would begin. Into a vacuum suit and out of the boat, equipped with a steel pick and an electric drill; also such necessities as a spare oxygen tank, food tablets (inside the suit), a flashlight hanging on the belt, a battery to run the heating coils, a bag for rock samples strapped on the back, and the miniature radio set, with which last item the wearer could keep in constant touch with someone

back in the boat. Any spot would be picked out and then the silent blows of the sharp, leaden-weighted pick would work into the crumbly rock and dislodge samples of it.

A small number of pieces of rock, each from a spot a few yards apart, would suffice for that one place. These went collectively into a small bag and this into the big bag on his back. Then the prospector would change his locale, moving at least a quarter mile away. Here he repeated the sampling, using the drill if the rock was hard and unyielding. As he moved from place to place, gradually filling the big bag, he had to keep his sense of direction in order, and also had to carefully observe any markings he could, not only to be able to find the place again, but to be able to return to the boat, which would be invisible most of the time. Some prospectors had applied their brains to the task and had simple but effective systems by means of which these important details were consummated.

Then back to the boat he would go to look over the ore samples. This would consume hours of time for almost every asteroid had a different type of rock and one could easily miss a valuable find if one were careless.

Thus would the time fly. With the constant going in and out, the air in the boat, which was pleasantly warmed while out in space, would become cool and variable in density, although the automatic heaters and densifiers did a valiant job and kept the lack of comfort within reasonable limits.

Then the constant confinement in the stuffy suits would tell on the wearer's health, often precipitating fevers and deadly agues. The work, light by reason of the small gravitation, was, however, enormous when stretched over periods like six months. Then, although it was easy to swing the pick, it was also proportionately hard to affect the rock with the almost weightless implement. It was the pure muscular strength of the man, operating on the mass of the pick, that split the rock. Then the food, compressed and cold-storage, brought all sorts of ills to the prospectors, so that after a few months of such life, he would be a mass of raw skin, stomach aches and bone aches.

Then there were other hardships. The awful loneliness of silent space, that could make susceptible minds sink to brooding madness. The possibility of engine failure, shortage of fuel, shortage of the all-important oxygen, burning out of the battery-charging rocket motors, and a host of lesser things.

CHAPTER II

The Three-Cornered Rock

● But the hardships, weighed against the lure of immense wealth that might stare them in the face at some time or another, meant nothing. By the thousands they went out and by the hundreds they came back, some potentially wealthy, others broken in health and fortune, to become dispirited wanderers. But the urge never left them. Back home from a trying trip with nothing to show for it except an empty pocket, they would pester friends and relations for financial help to go back for another try.

The costs of prospecting in the asteroids were far more than local prospecting on an inhabited planet. The prospector had to buy his own ether boat, fuel, oxygen, implements and food. Then the costs of getting his boat into space were a very big item. Small boats like those were never equipped with the powerful engines that big liners had to leave and land on a planet. The owner had to pay a professional concern a certain sum of money for which they would clamp his little boat onto a huge-engined space tug-boat. This boat would take him about five hundred miles up where the little engine would then have enough power to propel it away from the powerful pull of the planet. On the return trip, the prospector had to stop his ship some thousand or so miles away from the planet and radio for a tug-boat to bring him to the ground.

If the prospector had made a find, he could pay the government officials with the ton or so of ore he had along to get a legal claim filed. A professional claim-filer would go along and use his intricate mathematics to mark the exact place on the exact asteroid for entering in the government records. Needless to say, their fees were high. Then the worst was over. With the ore samples, the prospector could sell out to some professional mining concern, or get sufficient backing to start one himself.

There was one other thing in the prospecting pursuit that had to be allowed for. The man or men must be able to find that particular asteroid again amongst the thousands there were. Consequently, one of the members along had to know enough about planetary mechanics to plot an orbit and rate of motion. If the asteroid was listed in the records, all well and good; there would be no further trouble in finding it again. But if it were one of the unknown ones (and there were many of them in those days) it would be necessary to use extreme care in plotting the orbit and motion.

And it was this latter item that had brought about the trouble between Hanson and Timothy, as their boat rested on a small asteroid. Timothy had insisted he could recognize the asteroid again if only someone would finance a return trip. Hanson, himself a prospector of long standing and indifferent success, had taken the chance. Six months of ceaseless roving, sampling, and drilling had failed to reveal the wealth of platinum "by the three-cornered rock" as Timothy put it. Either Timothy's memory of the three-cornered rock was badly distorted, or three-cornered rocks such as he had in mind were common, for he yelled "there it is" only too many times for Hanson's patience and sympathy.

Now Hanson was in a murdering mood, determined to vent his terrific anger on the little, red-nosed sot who had brought on him this profitless venture. It was not really Timothy's fault. He had openly admitted in one of his rare sober moments that it was quite a long chance to take, but it was his drunken ravings that so incensed Hanson. For when Timothy was drunk, he could make the other's eyes bulge and his mouth water, figuratively speaking, with his ceaseless talk about the precious white metal that should be around there somewhere. It irked Hanson all the more to think that even allowing for the error in Timothy's figures, the find could not be so very far away. Possibly only a few thousand miles away was that bed of platinum ore guarded by the "three-cornered rock" that had infested Hanson's dreams and flavored Timothy's drunken speech.

The door between the engine room and the main room was small protection for the frightened Timothy. Hanson heaved his great hulk against the door and lumbered into the room.

"Come out here with me, you pickled rat!" ejaculated Hanson. He grabbed the screaming man by arm and leg and dragged him back to the main room.

But Timothy became possessed with unusual strength as Hanson attempted to clutch his throat to satisfy his insane murder lust, and squirmed out of his hands. Hanson was thrown off balance by Timothy's foot and flew toward the front wall. Timothy watched him with fearful eyes as he bumped with his shoulders and cavorted around in mid-air a moment trying to get his feet down.

Hanson shook his eyes clear from the bump and fastened them on the luckless Timothy across the room.

"Why, you little . . . " he said, filling out the sentence with a flood of harsh epithets. "Got me here. Got me in debt. Drove me crazy with your damned three-cornered rock. Do you think you can stop me?"

With that he leaped toward Timothy in a long arc. But when he landed, Timothy had scuttled out of his reach with the cunning and agility of a monkey. He was silent for he knew it would be useless to remonstrate against the maddened, degenerate Hanson. But his fear-sharpened mind was working, working to save his miserable life. No one would care that he died. There was not a soul in the universe who would shed a tear to hear of his decease. But the drunkard wanted to live just as strongly as anyone else.

When Hanson leaped at him again with a torrent of curses and maledictions Timothy had in his hand one of the largest rocks in the vat. There was a crunch as the fat man's head met the rock. Then Timothy looked a bit dazedly at the still form stretched out on the floor.

● Timothy had none of his companion's bestiality in him. He had struck with the rock in pure self-defense. Now that it was over, he felt weak and frightened, even more frightened than he had been to see Hanson's evil, mad eyes glaring at him in blood-lust. He felt dizzy and his wildly-beating heart refused to slow its pace.

With a shuddering glance at Hanson's sprawled form, he stepped carefully around it and staggered to the cupboard with weak knees. He looked back at times, wondering what he would do if his companion should suddenly arise, more angered than before. With eager trembling hands, he opened the cupboard door and clutched at the bottle of liquor therein. With long practiced skill, he tipped the half empty bottle to his lips and poured the fiery liquid down his tickling throat.

Stimulated by the draught, he squared his shoulders somewhat and shook a warning finger at the senseless man.

"You would try to choke me, you . . . you beast!"

Timothy, for all his careless life, was not given to cursing.

"Now see what that got you"—another swig from the bottle—"a good bump on the head. Wouldn't believe me, huh? Thought that was my imagination or this . . . this drink here . . . but it's true, every word of it. If I could only see that three-cornered rock from the right angle, I'd know it again. Might have passed it a dozen times for all we know—but it's so hard to see around these asteroids . . . shadows . . . "

With which words he finished the bottle and tossed it into the aluminum tub. Just as he did this, Hanson groaned and turned over. Timothy shrank into a corner and stared at him with fearful eyes. But the fat man relaxed again and became still.

"Got to do something," muttered Timothy. "He might try that again if I don't get a chance to argue him out of it."

Some ten minutes of rambling thought finally resulted in an idea that caused the now pleasantly inebriated little man to snap his fingers in triumph, or to try to snap his fingers.

With clumsy haste he extracted a long rope from the supply chest against one wall. Then he looked speculatively at Hanson's bulk, trying to figure the best way to put hands on him to get him into the metal bench along the front wall. With much puffing and blowing, Timothy dragged the unconscious man to the bench and heaved him onto it easily enough, what with the light gravity and his desperate haste lest he awaken too soon.

Timothy lashed him securely to the bench, knotting the ends carefully out of possible reach of a freed hand.

He looked over his handiwork and grinned in satisfaction.

"Guess that'll hold him till he gets his right mind back."

This great task done, the liquor filled prospector sat down to wait for Hanson's return from dream-land. But the monotony and utter stillness bit into his nerves. He climbed the short ladder to the pilot room which was a little one man cell whose roof was glass almost as tough and strong as steel. He seated himself in the pilot seat and gazed around with bleary eyes. From this position the pilot commanded the entire view on all sides and also upward. Only the portion of the view blocked by the boat itself was invisible.

Timothy, drunkard though he was, was no mean hand at the controls and in his younger days had stored away quite a bit of space mechanics, so that he was more fit than many a man to pilot an ether boat. He threw the switch which sent waves of heat around the rocket tubes in back to warm them up to the point where it would be safe to explode gases through their sturdy length.

Ten minutes later, during which time he strained to hear if Hanson had come to yet, he set the keys to send the ship up at an angle. He pulled the starting handle a fraction of an inch along its smooth grooved course. With a mighty rumble the rear tubes blasted their song of power and in a graceful arc the little blunt-nosed, cylindrical ether boat left its roosting place. Once safely away from the asteroid, Timothy reset the keyboard for a straight course, peered long and steadily at the void in front of the boat to make sure he was not running into another asteroid, and then took his eyes away from the sky.

Thumbing the course-book clumsily, he looked up the approximate position of Mars in relation to their region, his blurring eyes and alcohol befuddled brain

hardly able to interpret the printed words and figures. Satisfied, he stopped the rockets, set the keys as the course-book prescribed, and again pulled the rocket tube control for the back. He reeled to the side of his seat as the boat swung in a gentle curve, and then fastened his eyes onto the regions of space in front. Even in his benumbed state he knew and remembered that he must avoid asteroids.

Just a short time later as the boat gradually picked up velocity at small acceleration, Timothy blinked his eyes at what he saw on one of the asteroids that loomed to one side and receded again to the back. He shook his head unbelievingly and then flung his trembling hands at the keys.

"Unless I've gone cuckoo, I saw that three-cornered rock," he muttered as he set the keys for a complete half turn. "And not just one of those strangely familiar rocks, but the very same one I saw by that platinum bed!"

The cylindrical vehicle gently swung in a half circle at his manipulations with the keys, and blasted the rear tubes straight into its course of flight. But Timothy put on all the rocket force it was safe to use to slow the boat. He was pressed uncomfortably back into the seat. Far in front he could see the black outline of the asteroid he wanted to reach, that he had just passed. It grew smaller for a while as the rockets cut down the forward inertia, then began to grow in size as the boat was pushed back along its previous course.

● Timothy, his brain cleared by the excitement of the discovery, judged the distance nicely and applied deceleration at just the right time to bring the boat to a light halt within the asteroid's effective gravitation field. Anxiously he peered over the nose of the boat at the dim surface of the asteroid as the boat settled downward like a thistle.

"Hurray!" he screamed as he made out the sharp outline of a three-cornered rock at the peak of a low, jagged hill. "That's the one . . . and no mistake this time!"

A few clever thrusts with the rockets and the space vehicle bumped to a gentle landing not twenty yards from the hill whose peak was a triangular rock, symbol of wealth in Timothy's mind by past association.

Shutting off the engine control, the little man, sobered wonderfully by the thrilling thought of the waiting platinum, scrambled down the ladder. He slipped just below the ceiling of the main room and floated majestically to the metal floor. After a few kicks he regained his upright posture and dived into the supply chest after a hasty glance at the still senseless Hanson.

He dragged out a vacuum suit and laid it out on the floor, back side up. Then he dashed into a little room off the main one. Set in one wall was an air seal. Pulling a handle at the side, he waited nervously a few seconds till there was a bang from beyond the seal. Then he wrenched at the handle and swung back the seal. An electric motor did the actual opening. His puny muscular strength could never have pulled open the seal which had a vacuum on its other side. No man can conquer internal air pressure against a vacuum.

As the seal first opened a crack, the air rushed in to fill the vacuum, whistling loudly as it was sucked into the crack. As Timothy snapped on the light inside the vacuum refrigerator in which was kept their food and oxygen, his hand grew numb from the intense coldness of the air. But in total disregard of such a trifling thing, he who had frozen oft and miserably, pulled out an oxygen tank, after carefully wrapping a cloth around the space-cold metal handle. He looked at the gauge. It read nearly full.

He banged shut the seal, jammed the handle upward. As he left, the hiss of escaping air resounded in the metal walls. The little pantry was again a vacuum.

Timothy carried the tank to the main room and pushed it down on its clamps that held it to the back of the suit. Then he screwed in the air line. Holding the suit aloft, he slipped his frail body into it from the top. Then he pushed the ingenious air-tight flanges together and tucked the padding carefully about his neck. Hardly able to control his agitation, he fitted the globular glass helmet onto his neckpiece and sealed the flanges. Then he screwed in the oxygen pipe which came under his armpit from the back. The pipe leading to the carbon dioxide absorber was the last connection. Just below the neck was the valve. He opened it slowly to let in the oxygen and closed the valve connected to the open air.

He was now sealed off from the atmosphere of the room altogether. He allowed full pressure from the oxygen tank at first till the suit bulged out, just to see that all the connections were tight. This he could determine by watching the pressure gauge on the arm of his suit. If it remained constant, there was no leak.

Satisfied, he reduced the pressure to normal by opening the escape valve momentarily. Now he was ready to venture out to see if he had really struck the right place, although in his mind there was little doubt. He crouched into the tiny dark air lock and pulled the handle release for the outside door. With a soft "whoosh" the air in the lock fled and Timothy's suit bulged out to its maximum limits. He didn't take along a pick for he knew if this were the right place there would be ore samples lying around from the previous visit.

Madly he bounded like a bloated frog to the base of the low hill which was peaked by a three-cornered rock. Then he sank to his knees on the hard rock and babbled incoherently as he saw evident signs of the marks of sharp picks and drills. Grasping a lump of rock he held it close to his eyes against the glass and turned to let the sun light fall upon it. He had to slowly turn his body to keep its rays centered on the rock because the sun and all the Heavens revolved most distressingly due to the peculiar rotations of this asteroid on its axis.

But it was unmistakably there—gray stains and lines running through the rock. Platinum! A tremendous fortune of it spread before his eyes. That whole hill beside which he stood was probably reeking with it because that other time they had been there, samples taken from all this region had carried those gray lines.

Timothy, stunned for a moment by the thought of what this find would mean to him and his companion,

suddenly broke his trance and fell to picking up some of the samples to bring to the boat. Hanson wouldn't try to choke him anymore—not if he held before his eyes those rocks and told him what they were. Hanson would be only too glad that he had failed in his mad attempt at murder before. But Timothy wouldn't hold that against him; in the glow of fleeting visions of future opulence, he would have pardoned a dozen such misdemeanors.

CHAPTER III

Murder

● Hanson was quietly looking at Timothy when the latter again entered the boat and dumped his rocks on the floor. His piggish eyes, at first angry and baleful, opened as wide as they could at the sight of Timothy's radiant face. His anger died by fits and gusts and was replaced by curiosity at the strange antics of the little man.

Timothy took off his helmet, and in doing so, dropped it. Clumsily he grabbed at it as it floated floorwards, but only succeeded in knocking it down faster. It hit the metal floor with a clang and bounced around like an animated creature. It did not break; it was the so-called steel-glass.

But Timothy lost all interest in it after that wild attempt to catch it. He was engaged in the process of taking off the vacuum suit, trying to do it slowly and with dignity, but with the worst of luck, finally losing his balance and cavorting all about the room before he won free of the affair. Then he straightened himself up to full height and tucked his trousers to a semblance of order.

Hanson had watched all this in astonishment. Now he could contain himself no longer.

"Timothy, take off these ropes."

The little man, however, paid no heed to him. He carefully picked up two of the rocks and looked at them closely.

"Timothy, take off these ropes!" roared Hanson exasperated. Then he added quite naturally, "Don't worry, I won't try to touch you."

The drunkard, feeling the effects of the liquor again as the intensest thrills from finding the triangular rocks were over, arched his eyebrows in an attempt to look sternly nonchalant, as if trying to make a little boy feel his guilt for having done a wrong.

"Of course you won't touch me, Hanson," said Timothy, his voice pulsating with excitement so that his companion looked at him closely.

"You've been drinking, Timothy, and you're off your head."

"Yes, I've been drinking, and I'm going to do a lot more drinking . . . in the near future. All I want from now on. Won't have to worry where the money's coming from either. I'll just drink and drink and . . . "

"Timothy!" roared Hanson. "Will you take off these ropes and tell me what's got into you? No, you don't have to tell me—you're just crazy drunk again. Listen, untie me and hurry. I was a . . . a little angry before, but I'm over it now. But what in the wide world were you doing outside, anyway?"

"Hanson, I'll tell you," said the little man grandiloquently, almost proudly, if there was any pride left in him. "We're on a different asteroid than the one where you tried to maul me. In fact, we're by the three-cornered rock. Look, Hanson,"—Timothy lost all his posturing and eagerly held the rock lumps in front of the other's nose, hands trembling—"Platinum, white metal, loads of it! Outside! By the three-cornered rock!"

For a moment Hanson looked dazed, incredulous. Once he looked sharply at the little man who was muttering "platinum, loads of it, millions" to see if he were not perhaps insanely drunken. But the rocks—Hanson could see with his own eyes that it was platinum.

Timothy feverishly untied his companion. Hanson raised his great bulk and stretched the kinks out of his body. Then he fell to examining the lumps with a magnifying glass, as did Timothy. Then they looked at each other with a queer feeling inside them. A wealth in platinum! A dream come true!

* * *

Hanson turned his little puckered eyes on the babbling little man as they were sorting out a batch of lumps, separating the poor ones from those rich in platinum. It was a week later. In that time they had picked, drilled, and pounded into the rich ore beds with energy inspired by the glistening thought of the wealth that was now theirs. This was their last time. A ton of ore (figured by earth weight) lay in their ore room. That would be all the little boat could safely handle. With that they would pay the government for plotting the claim, and finance all negotiations necessary to legalize their ownership of the find.

All during that time Timothy had refrained from drinking himself to incapacity, partly because he was as eager as Hanson to get back to Mars, mainly because Hanson had threatened to toss out every bottle if the little man didn't do his share of the work. Hanson had also hoped that the constant soberness would quiet his ambling tongue, but it was not to be.

Intoxicated by the thought of wealth, Timothy poured out oceans of words—nonsensical, inane words that brought a growl from the fat man when driven to the verge of exasperation. Then Timothy would remain silent for a while till the incident was forgotten. A short time later he would be going full steam, flavoring his speech with an impossible conception of what he would do back on Mars.

This last day Hanson let him babble on without interruption. A thought had arisen in his mind—a thought that he first quelled and then nurtured. It was a sane thought that had come to him in a sane mood. It was not a blazing thought induced by his flaming temper. The thought was—murder!

He had wanted to do murder once before on the little man, but that was in a fit of disappointed anger. Now he wanted to do murder so that he could have that fortune on the asteroid all to himself. In a week's time, Hanson had become dazzled by the thought of wealth. Wherever they dug, there was the precious white metal. There was enough to make ten men sickeningly opulent, but Hanson's narrow, degenerate mind began to covet the 30 per cent that would be Timothy's by former agreement. Coupled with his greed, there was an urge of hatred in Hanson against the voluble little fellow. It was hatred nurtured by

contempt and exasperation at his pitiful, childish talk and his colorless, mouse-like personality.

● Finally the last of the rocks was tossed into the ore tub. Timothy sprang up full of that intense energy he had had all during that last week, grasped the handle of the tub, and proceeded to drag it to the ore room.

Hanson did not stir from his stool. His mind began to work on the idea that had stolen upon him that day. There would be no danger, no future complications, if Timothy were murdered, Hanson knew. Hardly anyone on Mars would remember the little red-nosed man, and furthermore few, if any, persons had been aware of the partnership of these two men.

There had been no eye witnesses of their departure in each other's company, and even if someone back on Mars did ask about Timothy, Hanson knew he could say almost anything and be believed. For many a man had left his bones on the asteroids. Hanson could easily explain away his partner's disappearance; he could say he had gone prospecting alone on some asteroid and never returned to the boat; he could say he had died from fever or the ague that was so common among prospectors.

How should he do the deed? Strangely, that bothered Hanson a good deal. If he could once work himself into a deadly rage, his baser instincts would do the job without hesitation. He would strangle him then. But Hanson could not wait for anger to supply him with inspiration and blind purpose; he must do away with the little man cold-bloodedly and sanely and quickly. He could not poison him nor shoot him, having neither the poison nor the gun. There were ways that presented themselves in his mind, but they were revolting in their horribleness. Then a thought struck him that brought a gleam to his puckered little eyes. He licked his fat lips and closed the question in his mind. It was decided.

After some banging around while emptying the tub in the ore room, Timothy returned, unaware of the stare that greeted him from the fat man who still sat on the stool like a graven image.

"That was the last of it, Hanson," gurgled Timothy as he picked up the bottle of liquor beside his stool. "Tomorrow we start back to Mars."

He took a long draught at the bottle. "A good night's sleep and then we'll skip. We've got the exact figures now. You checked them three times yourself. Won't we surprise the boys back at Port Monto? I'm going to walk in with a roll of ten dollar notes and scatter 'em to the four winds. Then I'm going to buy a little place to live and stock up with the best drinks in the . . . "

Timothy stopped his rapid verbal outpourings, suddenly cognizant that his companion had a peculiar glint in his eyes. Fear arose unbidden in the little man's heart and he swallowed painfully. He knew Hanson enough to know that when he persisted in staring at him—ordinarily Hanson brutally disregarded Timothy as if he were a stick of wood—he must be thinking about him; and that frightened Timothy all the more that Hanson should be thinking about HIM!

The fat man swayed his bulk slightly and ran a dark tongue across his lower lip. "Timothy, there's a king's ransom outside our boat."

The little man nodded jerkily and waited breathlessly for the other to go on.

"A king's ransom," repeated Hanson. "What have you ever done, you drunken rat, to deserve part of it?"

Timothy gasped and spluttered, attempted to answer the surprising question, and then turned to his bottle for courage and inspiration.

"Nothing!" roared Hanson, answering his own query, causing Timothy to choke on his liquor and drop the bottle. "Absolutely nothing. You don't deserve to have a bit of that wealth. You've pickled yourself in alcohol all your life. No liquor-reeking thing like you are deserves . . . "

But Timothy cut him off with a sudden display of spirit. "I deserve it as much as you, Hanson. You would never have found it without me. And I'm getting only thirty per cent. Besides, what's the use of quarreling about it? There is more than enough white metal out there for both of us."

There was a moment of deathly silence. Hanson's pebbly eyes blazed in greed and avarice. Hatred for his red-nosed companion and lust for his share of the find radiated from his grossly sensuous face with its fatted jowls.

"You don't deserve it, you cursed sot, and you won't get it!"

With these words Hanson swung his fist in the other's face and knocked him against the wall. Timothy picked up a rock from the discard tub and threw it at Hanson as he lumbered up to carry his plans through. But the rock missed and the fat man grabbed him about the legs and swung him like an ax. The little man screamed and struggled but the repeated blows of his head against the metal wall finally rendered him unconscious.

Hanson looked down at his still form a moment. Then he picked him up and carried him to the small bedroom which contained two sleeping bunks. In the wall nearest the hull was an air seal. He opened this. In the tiny chamber revealed rested a small ellipsoid metal object with a bulge of steel-glass on its top surface—the "life boat."

Due to the constant dangers of meteors in space which might at any moment crash through an ether boat, each space vehicle carried one or more of the life boats. They were simply little one-man ether boats, miniature models of the larger craft, equipped with small but efficient rocket motors. If for any reason the larger boat became unmanageable, damaged, or useless as a vehicle, the passenger could then embark in the life boat and propel himself within reach of rescue. Each life boat was equipped with a radio. They also carried food, oxygen, and heating apparatus.

Hanson, holding the little man in his arms, smirked as he saw the dull metal ellipsoid boat, for it entered his plans of the moment. On its side was emblazoned the same number as was on the outside hull of the bigger boat—P-322-M-505.

The fat man placed his unconscious companion on the floor, opened the door of the life boat, and proceeded to plunder it of all food and rocket fuel, and also of most of its oxygen.

Then he shoved the limp form of the little man into

it full length on the curved floor. There were only two positions possible in it: lying flat on the bottom, and sitting up with one's head in the bulge of glass which served as a piloting lookout. Hanson banged shut the door.

This done he closed the bedroom seal, donned a vacuum suit in the main room, and stepped out onto the asteroid. He walked to the other side of the boat, pulled open the seal letting the air out with a rush, and dragged out the life boat containing the senseless Timothy.

All was now done to Hanson's complete satisfaction. He was sending Timothy to death, sure death without fuel to avoid asteroids and food to keep his body alive. Why should he kill the little drunkard in other bloodier, more sudden ways, when this was so easy?

Hanson's face overspread with a demoniac grin as he looked first at the ellipsoid object and then around at the crumbly rock hills near the ether boat. A wealth in platinum—and it would all be his and his alone!

Stooping, the fat man grasped the life boat by two of its many rocket tubes, raised it to his chest, and pushed it away from him forcefully. He knew that the gravitation of the asteroid was so small that it would fail to draw back again the little craft as it shot away from him like a blunt bullet.

But before the little object passed out of view altogether, a ghastly white face with wide, fearful eyes appeared in the glass bulge and looked back to Hanson with a pitiful expression of horrible despair.

Hanson began to laugh then, and laughed insanely till he once again took off the suit in the ether boat.

"Mine, all mine!" he shouted, waving an arm to include all the visible topography. "He didn't deserve any of it, the little rat—and now it's all mine!"

CHAPTER IV
Justice

● In a magnificently decorated arched room sat two men facing each other. The one was young and neatly dressed, but there was a look of sharp disappointment on his face. The other was obese, dressed in the height of opulence of the twenty-second century with numerous flashing jewels on his silken garments. His face was repulsively stern and implacable.

"Then you refuse to loan me a paltry fifty thousand dollars," said the younger man bitterly, "which would tide my company over until we can collect on that Venus deal?"

"I absolutely refuse," said the fat man with a cold leer. "You haven't given me near enough assurance that your company will ever gain on the deal. And as I am not in the habit of throwing away money, I can't help you."

The younger man stared at the other a moment in rising anger. Then he turned on his heel and strode to the door.

But before he left he turned to the fat man:

"I was told, Mr. Hanson, that you were the most hard-hearted man in God's world. But by the Heavens above, you're worse than that; you are a thing of meanness and evil, not fit to be called a human being!"

The door banged shut.

Egard Hanson's face grew dark at the insult. He took a few steps toward the door; then changed his mind. A grin of pure maliciousness appeared on his face. He seated himself comfortably, extracted a small disc from the end table, and spoke softly into it.

"Venus relay station," came a voice from the disc.

"Give me contact with Timtillo, Venus. This is Egard Hanson speaking."

"Yes, sir. Immediately, sir."

"Earth relay station, Timtillo, Venus," came from the disc.

"Call New Boston, Venus, and my party is James Veloe."

"Hello, hello, James Veloe speaking," came after a short delay.

"Hello, Veloe. This is Hanson. Veloe, I want you to look into the deal between the Cristobal Berylhum Co. here in Indianapolis and the Venus Beryl people. Whatever the state of affairs, see to it that the deal does NOT go through. Cristobal Co. needs a little shake-down. Get it?"

"Trust me, Mr. Hanson."

"There'll be ten thousand in it for you, Veloe. Goodbye."

Hanson put away the disc and relaxed with a sigh of satisfaction into his cushioned seat. His piggish eyes gleamed brightly as he thought of how he had avenged the biting insult of the upstart who had come to him for financial help and then gotten angry at the refusal.

Of course fifty thousand dollars would have meant nothing to Hanson. He could have thrown ten times that amount in the river without a pang. But Hanson wasn't the man to help others over rough places just for love. He had an immense fortune, but that was HIS good luck, not anybody else's.

A few minutes later the door opened again. A slim, appealingly clad girl danced into the room and fell into his lap. Her arms went about his neck.

"Hello, dear!" she said sweetly. "Oh, dad, how can I ever thank you for that simply beautiful necklace. Why, it must have cost a mint of money! And it's positively gorgeous!"

"I'm glad you liked it," returned the fat man, his gruff voice diluted with as much softness as was possible. "As for the cost—hmmph—there is NOTHING too costly in this world for you. Ever since your mother . . . died . . . "

"I know, dear! I'm all you have left to love, and you've shown that SO many times . . . "

"Now, now, surely that isn't a tear in your pretty eye, Elaine? Come, now, smile for your dad. I see so much of people who smile at me only because they see me as a bag of gold, that I sometimes simply yearn for your sweet, honest smile, my darling."

"You flatterer!"

The girl nestled in her father's arms. Then she sprang erect.

"I almost forgot what I wanted to tell you, dear. I'm taking a trip to Jupiter next week! I've heard so much about the beautiful scenery there that I can't resist going!"

Egard Hanson sat up suddenly "What! To Jupiter? No, Elaine, you had better not."

"Why—why not?"

"Because of the danger, Elaine. You know, just a few days ago a meteor crashed into a liner bound

for Saturn and killed outright three hundred and more people. I don't want you to risk . . . "

"Oh, bosh! Those accidents don't happen very often. Why should a meteor pick out little me who hasn't done anybody any harm? Now, dear, don't argue with me, you know it won't get you anywhere!"

Elaine smiled triumphantly at him. As a sigh of resignation escaped his lips, she flung her arms around him and kissed him.

"But I'll worry about you, darling. I DO wish you'd stay on Earth here. There's plenty of excitement and scenery on this planet . . . "

But with a tinkling laugh, the daughter tripped away, her eighteen summers of life unknowing of the dangers and tribulations of a world that she saw through a platinum-studded, gold-tinted glass.

When his daughter was gone, Hanson's face again set into its normal mold of arrogance and ruthless power, for there were many things occupying his mind of a desultory nature. He had taken care of Cristobal Co. but there were certain other business institutions with whom he had clashed and who needed a shake-down . . .

● But Hanson was not to be left alone this evening, it seemed. The butler announced a gentleman to see him.

"Orville Stibb? Never heard of him," said Hanson. "Shoo him away."

But the butler returned to say: "Pardon, sir, but the gentleman says he used to know you when you were a prospector and lived at Porto Monto, Mars."

Hanson started slightly and then waved for him to be presented.

Orville Stibb entered, dressed in usual prospector clothing which was somewhat the worse for wear. He smiled graciously as he saw Hanson and advanced with outstretched hand. But Hanson ignored the hand and stared coldly at the man. Evidently here for a touch, he thought.

"Certainly is a pleasure to see you, Mr. Hanson, after all these years, twenty years to be exact."

"Never mind about that," said Hanson boorishly. "If you have anything to say, out with it. I suppose it's money you want?"

"No, no, not exactly, Mr. Hanson. There's just a little matter I'd like to talk about—it goes back twenty years."

Hanson bent his puckered eyes on the other.

"Well, what?"

"Just this, Mr. Hanson. When you left Porto Monto twenty years ago before you came back with a fabulous find, there was another man with you—a Jeremiah Timothy."

Hanson's hands fumbled a moment with a cigar that he picked up and lit. Then he assumed a sorrowful look.

"Yes, I did have him for my companion. He was the one really found the ore-bed, you know. But, poor soul, he left our ether boat one day without enough oxygen and when I found his body—well, you know, Stibb, how those things happen. I was so sorry, because I really wanted the poor fellow to enjoy some of that wealth."

But Stibb's face had become suddenly crafty, sarcastically impudent as he detected the insincerity in Hanson's voice.

"Yes, I imagine it was a bad blow to YOU that you had to take the whole thing instead of sharing it."

"What do you mean?" cried Hanson, his voice crispy.

"I mean, Hanson, that it might produce a scandal if I were to suddenly announce to the right authorities that you had a companion that never returned."

"Well, what of it? He died. Is it my fault? Prospectors die by the hundreds out there in the asteroids."

"Yes, they do, Hanson. But their death's are always REPORTED if one or more of the party returns. You, Hanson, neglected to report that a certain Timothy died on an asteroid, when you got back and negotiated your find. If I were to reveal that fact to, let us say, a relation of his—after much searching I DID find that he had one living relation, a cousin—I think you would not relish the trouble that would bring you."

Hanson thought for a long time. Then:

"All right, Stibb. What's your price?"

"Five hundred thousand dollars!"

Hanson gasped, opened his mouth to protest, then closed it. He rang for his servant and gave him orders to bring paper, pen, and check-book.

"Here, Stibb. Write out at my dictation a statement that you have received a half million dollars for services rendered and sign it. I will give you my check."

Orville Stibb arose, letting out a huge sigh. Without a word he bowed slightly, mockingly, to the fat man and left. In his pocket was the check.

Egard Hanson sat alone, smoking his cigar. Twenty years had rolled by since he and the little drunken Timothy had embarked for the asteroids. They were twenty years of lustful, brow-beating opulence; mean, spiteful satisfying of a colossal ego and a general hatred of his fellow men. Even his wife whom he had married almost as soon as the wealth rolled into his lap, suffered mutely from his harsh nature. Only his daughter, the sweet, innocent Elaine who looked upon her father as a benign, genial saint-like old man, escaped the baser acts of his life that caused countless people to curse his very soul as the devil in human flesh. She knew nothing of such things. Her father was a prince of men. She was the embodiment of Hanson's residue of conscience. Only in her did the ruthless capitalist display something of a better nature.

Orville Stibb had brought an echo from the past into the room. The name Timothy, which Hanson had not heard mentioned for twenty years, brought a vague sense of unrest in the wealthy man's mind. He did not sleep well that night.

● "Goodbye, daddy dear!" cried Elaine, flinging her arms about his neck. "I'll be back in five weeks. Now don't you dare to worry. I took this stateroom nine tiers removed from the hull just to satisfy you, although I would have loved one up against it so that I could look at the stars anytime I wanted. Oh, I'm going to have a perfectly lovely time, I know!"

Hanson kissed his radiantly happy daughter, looked at her fondly for a moment, and then left. Out in the corridor he was joined by one of his paid associates in business, who was also something of a friend.

"Wonderful girl, Elaine," sighed the friend. "Pretty and sweet."

"Jones, I don't know what I'd do without her," said Hanson. "She fills a place in my life that I don't think I could do without."

Then he looked at his companion slyly as they walked down the long corridor filled with people bidding each other farewell and bon voyage.

"She will make a wonderful wife for some man."

Jones flushed and agreed. "Mr. Hanson, this is hardly the time and place to say it, I know, but I hope to ask for her hand soon—with your permission."

Hanson laughed. "The bashful suitor in person." Then he became serious.

"Not a bad idea, Jones. You've been faithful to me for five years and I think you're just the man. Of course, now, don't raise any high hopes. Never in the world will I force Elaine into marriage. You must win her consent without any aid from me."

Jones smiled with pleasure.

Then the two men arrived at the captain's office.

"Ah, Mr. Hanson, a pleasure to see you," said the captain with a bow.

"Yes, yes," said Hanson tersely. "I came here to remind you again that my daughter is in number 119, tier nine. If anything happens, my dear captain, it would be well for you to see that her room is immediately looked into. Not that anything is very likely to happen . . . but above all my daughter must be protected from any danger."

"Quite right," murmured the captain as the fat man shot him a stern look of command. "Thank you, Mr. Hanson, for the check you sent me yesterday."

Hanson strode from the room followed by Jones. Outside the door he accidently bumped into a man who was walking by hurriedly.

"I beg your par . . . "

But before he could finish, Hanson swung his fat hand across his face.

"That will teach you to be less clumsy when Egard Hanson walks by you!"

The mark of the blow became surrounded by an intense flush of anger. The man looked at the retreating figures, repeated the name to himself, then lost his anger. Other men had bucked the power of Egard Hanson and brought great troubles down upon themselves. He was an impolite pig, but . . . he had wealth.

* * *

Three days later a white-faced man stood a moment outside Hanson's private study in trembling indecision. It was Jones. Finally he softly opened the door and walked in.

"Hello there, Jones," called Hanson looking up from some papers he had been reading. "Come here and sit down, my boy."

As Jones silently approached, the light fell on his white face and fearful eyes.

"Why, you're sick, Jones!" exclaimed the fat man, but Jones shook his head.

Hanson leaped to his feet, suddenly pale himself. "Jones, what is it! Quick, tell me!"

But Jones could not find his tongue. He mutely held out a folded paper and sank into a chair.

Hanson wrenched open the paper, glanced at the message therein, then gave a wild cry of utter agony.

"Get out!" he screamed to the shrinking Jones. "Get out of my sight! Oh, my daughter . . . Elaine . . . "

Jones slunk out.

Hanson quieted himself then and read the message to the end. His skin blanched. His piggish eyes opened in stark terror.

As he raised his eyes to the dark corner of the room, he moaned at the apparition he saw there.

It was Jeremiah Timothy, his pinched face reflecting deep sadness. Then the finger of the vision pointed to the gasping man of wealth. No words came from his dead lips, but there was a look of denunciation plainly written on his face—accusing the trembling, horror-stricken fat man of . . . MURDER!

With a low groan, Egard Hanson sank to the floor —dead.

In his hand was clutched the message from the Jupiter Space Road Co.

It read: "The liner *Jove*, bound from earth to Jupiter, was pierced by an object while *en route*. It is with the deepest regrets that we inform you that your daughter, Elaine Hanson, is numbered among the dead. It was not a meteor that struck the liner. It seems to have been a derelict ether boat or possibly a life boat. The death of your daughter was unavoidable as the object crashed through to the tenth tier, opening all the corridors in that section to the vacuum. The only definite things we know were that the derelict must have been going at a terrific rate, and that it was absolutely impossible for the pilots to avoid meeting it. However, we have the number of the derelict. By some miracle a piece of it remained intact, hanging on to the jagged hole by a fused thread. With this number, which is P-322-M-505, we are going to prosecute the Space Derelict Clearance Co. for criminal negligence."

P-322-M-505 was the number of the life boat that had been tossed away from the asteroid of the triangular rock, containing the doomed Jeremiah Timothy!

THE END

THE MOON DOOM

By CLINTON EARLE FISK

● We present now the final installment of this interesting "unfinished story" contest. On the whole we believe that the various authors who have contributed succeeding installments have done a clever job of keeping up the interest and suspense of the initial installment.

The very difficult job of saving the earth from a collision from the moon has been worked out ingeniously. Although an astronomical physicist working out the "problems of three bodies" in differential calculus might find fault with some of the developments of the story, they appear on the whole to have been reasonably plausible. We close this contest in publishing the installment of Mr. Fisk, 2600 Boulevard, Jersey City, N. J., as the best finale to "The Moon Doom."

WHAT HAS GONE BEFORE

● Wilfred Hartley, amateur astronomer, notices a strange body approaching the moon's orbit. Unsuccessful in arousing official interest in it, he calculates that if it hits the moon it will send Luna possibly shooting toward the earth.

The invader turns out to be one of the asteroids, Ceres or Pallas, about 300 miles in diameter, that is plunging wildly through space. It hits the moon, apparently breaks into fragments and topples the moon out of its orbit. For days the world watches in uncertainty and then it is perceived that it has turned inward in its path toward the earth.

Tidal waves begin to spread over the coastland. His Staten Island home submerged, Hartley makes his way over the Island toward New York. He saves Witherspoon, a young aviator, from some thugs, and with Witherspoon, in the latter's plane flies over New York to see the city almost submerged under water.

Flying inland, the two men land near Harrisburg, Pa., in order to refuel their plane. There they meet a group of refugees headed by an astronomer, Downer, from the Princeton Observatory. Hartley tells Downer of having seen Ceres nearing the earth just as they were leaving New York. Hurriedly Downer makes some calculations. Hartley has a plan for saving them all, which he confides to Downer. Gathering all of their supplies they get into the plane and race toward the heavens just as the moon seems ready to crash on the earth.

The plane is blown upward toward the heavens. They discover that the atmosphere is leaving the earth, due to the pull of the moon, which is now near the earth. The moon breaks into fragments and the plane crashes on one of the newly-formed asteroids. Just as another of the asteroids is about to collide with their own, they get the plane free and shoot into the sky again. Meanwhile, apparently, a part of the atmosphere has returned to the earth. The earth is now livable for them if they can return again.

NOW GO ON WITH THE STORY.

● Again, as after the crashing of the plane on the asteroid, Hartley was the first to recover consciousness. He was lying full length on the floor. His head throbbed, and as he first opened his eyes, the Universe seemed to reel around him. For some minutes he lay without moving, staring up at the low ceiling.

Gradually the shattered pieces of recollection formed themselves into a pattern. What had happened? The last thing he could recall was that smiting, noiseless crash. Had the two asteroids come together? If so, how was it that the plane still survived? He could not tell whether he had been unconscious for two minutes or two days.

The plane seemed to be moving serenely through space, yet he now noticed that the engine had stopped. He was certain, however, that they were not standing still, for he could easily feel a motion of the cabin. Puzzled by this and the other problems, he sat up, pressing both hands against his aching head.

Hartley's first glance was, naturally enough, towards the controls at the front of the small cabin. Young Witherspoon was slumped back in the pilot's seat, one arm hanging lifelessly to the floor. Near him, old Prof. Downer lay in a crumpled heap. The others of the party were lying in similar attitudes around the cabin. In none of them was there a sign of life.

Through the strong glass windows, Hartley caught glimpses of the jet black sky of outer space, with its millions of brightly gleaming stars. A horrible wave of unnamable fear passed through his mind. He was sure his companions were all dead. His vision through the windows, and the slight forward motion of the plane, indicated that it was drifting somewhere in the limitless void of infinite space. Quite probably it had fallen into a new orbit around the earth, doomed to encircle it for all eternity. Or perhaps it had been driven off at a tangent and was headed out into the solar system, leaving its mother planet further behind with each passing second.

In either case, he could have but a few hours of life before the pitiful little supply of life-giving oxygen was exhausted. And he was alone! Horribly alone with the dead! Trapped with them in this tiny air-filled prison, which soon would be his coffin! It was the most horrible feeling possible to man, to be the only living thing, in a tiny cabin with seven dead! Hopelessly lost from everything else in all creation! He shrieked wildly, as full realization of his position came to him.

The sudden noise sounded strange in the complete silence of Infinity. He sank back to the floor with a groan, and then lapsed into a tense silence. Madness had him in its grip. He was listening! Listening for some sound from those seven silent forms! Listening for some sound in the soundlessness of outer space! There was nothing, no sounds save the gasping breaths he drew, and the hammer-like beating of his own heart. Demoniac laughter burst from his lips. This was unendurable! He must put an end to the silence; to this awful waiting for the end! With another shriek, he sprang to his feet, and literally leapt to the door of the cabin.

He could put an end to this horror! A twist of the handle, and the door would fly open, forced out by the

great pressure of the air behind it, hurling him with it into Eternity. Then, indeed, he would be free; free of this terrible solitude! His hand trembled as it sought the lever.

● Then he heard it! A sound, where there could be no sound! For an instant he hesitated, then he laughed again. He had imagined it. His shattered mind had created the thing he desired more than life itself; a human sound! But no, there it was again, unmistakably real! A low moan had come from somewhere in the little cabin; the moan of someone in pain; yet to the half-demented Hartley, it was the most beautiful of all possible sounds. It meant that someone among these seven was alive. He was not really alone in space!

Laughing again, but joyously now, he turned away from the door and looked about the little ship. A third time he heard the moan. It came from Prof. Downer. He knelt beside him, just as the old man opened his eyes. The professor blinked once or twice and rubbed his forehead with his right hand. When he tried to move the left arm, he found that he could not. It was apparently fractured.

"Where are we?" the scientist asked weakly. "What happened?"

"I don't know the answer to either question," Hartley replied with a humorless smile.

The old professor insisted on looking through the windows. The younger man succeeded in helping him to his feet with as little pain as possible to his injured arm. The two went to the windows on the left side of the cabin and looked out.

The blackness of space spread out on all sides and above the plane, but far beneath was a white ocean of clouds, concealing what lay below. As they watched, it became apparent that they were going forward with quite some speed.

"We seem to be in an orbit around the earth," Prof. Downer reflected.

"But how did that happen?" asked Hartley. "And how is it that the plane was not destroyed in the collision of the asteroids?"

"I rather imagine," the old man replied slowly after careful consideration, "that the collision was what put us in this orbit. The machine had torn free of the asteroid just before the crash. We were marooned on one side of the tiny planet you know, and it appears that the force of the crash sent the plane spinning out parallel to the surface of the earth with just enough initial velocity to counterbalance the attraction of gravity and keep us suspended here, three hundred miles above the ground!"

"Fate has certainly been kind to us, to let us live through all this," said the other in a low tone of awe. "Only by a miracle could anything have survived these frightful cataclysms of nature!"

"Perhaps it was intended that we alone should live, to carry on the human race," remarked the scientist. Then, with a bitter smile, "A fine chance we'll have to do that, hanging here halfway between heaven and earth!"

"Nothing seems hopeless, now that I find I'm not alone," said Hartley solemnly. "When I came to, I jumped to the conclusion that I alone lived, in all eternity. It maddened me, drove me to the very brink of self-destruction. God, what a horrible sensation!"

He shuddered at the mere recollection. The professor put a comforting hand on the younger man's shoulder.

"Let's look to the others," he said briskly.

● As they turned away from the windows, they saw that their pilot, Dick Witherspoon, was already conscious. He was feeling of himself gingerly, wincing now and again. Hartley hurried over to him, as Prof. Downer began examining the others.

"Any bones broken?" Hartley asked the young aviator.

"I don't think so," Witherspoon replied with a wry smile, "but I've certainly got more than my share of bruises and bumps."

The flyer poured forth a stream of eager questions as to what had happened, where they were, but the other held up his hand.

"Plenty of time for that later," he said. "We've got to help the professor; his left arm is broken."

The two hastened to join the aged scientist. Despite the pain of his injured limb, the latter was conducting an intense examination of the remainder of their party. The two young men made him desist, finishing the task themselves. They found that the only fatality was Murchison. The old man, a friend of the Downer family, had died of concussion of the brain, suffered when he struck the floor.

The rest, although badly shaken up and suffering many bruises and cuts, had survived the crash. Mitford, the mining engineer, was at this moment regaining consciousness. Mrs. Downer and her sister Mrs. Mitford, were still insensible, as also was Barton, the former U. of Penn, student.

Hartley and Downer now explained what had happened, and acquainted Mitford and Witherspoon with their present predicament.

"We've got plenty of gas left," said the aviator. "What's to prevent us from simply flying down?"

"You forget that there is no longer any air around us," the professor replied mearily. "Since the breaking up of the moon, the outrushing air which carried us up here has all either returned to the earth or continued on out into space. We are nicely balanced between the outward-pushing centrifugal force caused by our orbital speed around the earth and the inward-pulling attraction of gravity. There is no air to cause friction and thus slow us down. Slowing the plane is the only way we can return to the ground; and I know of no way we can do that."

Stunned by the thought of their plight, the four men went to the windows and peered out. There were now few clouds to obstruct their view, and they could clearly see the scarred and pitted surface of the earth, three hundred miles below. How tantalizingly near, and yet hopelessly far away it seemed! Although the upheavals caused by the approaching moon had so altered the planet as to make it wierdly strange and unfamiliar, the men regarded it with an overpowering loneliness and homesickness.

Just then they became aware of a rocky asteroid coming up over the horizon. It was Ceres; Ceres, the tiny world which had knocked earth's satellite out of

its accustomed orbit and sent it down to wreak havoc and destruction on the earth. Mitford cursed it, as though it were a living being, but Downer, who had been lost in thought, raised a restraining hand.

"It might happen that Ceres will atone for what she has done," he announced cryptically.

The others stared at him a moment in mute astonishment, then deluged him with questions. He refused to tell them more, however, and withdrew into a corner with Hartley. The two scientists were seen to be in deep discussion, and did considerable calculating on paper.

Ceres was obviously moving a trifle faster than the plane, for an hour later she had nearly caught up with it. The small planetoid filled a large part of the sky, for it was but a scant few hundred miles overhead.

Hartley and Prof. Downer had been at the windows for the past fifteen or twenty minutes, anxiously watching as the asteroid in its new orbit came slowly up behind them. Now they seemed elated, and turned excitedly to the others.

"I believe we're saved," Downer cried.

"How?" Mitford and Witherspoon demanded in unison.

"The small gravitational pull of Ceres is slowing our orbital speed down as it approaches us," the professor explained. "That will naturally decrease the centrifugal force pushing us outward, thus letting us descend to the earth."

"But won't we be drawn to Ceres itself, since it is pulling us?" Mitford asked doubtfully.

"Of course not," the astronomer replied. "We are a bit nearer the earth than Ceres, and the earth is much larger than the little planet; therefore the pull of Ceres is but an infinitely small fraction of the pull of the earth. On the other hand, the insignificant gravitational pull of Ceres is great enough to retard our speed a little. Much retardation is not required, for the celestial balances which hold the component parts of the universe together are very delicate, and easy to disturb."

Witherspoon took his place at the controls, in order to be ready to steer the plane as soon as it should come inside the atmosphere. The other three men watched spellbound from the windows. The suspense of those few minutes, during which no change in their motion or altitude was perceptible, was unbearable. At last, to the supreme joy of all on board, it was obvious that they were descending; the clouds below seemed coming up to meet them. The plane still had considerable forward motion, and as a consequence their fall was not rapid.

● They had all been so engrossed with the tense situation that no one had noticed how stale the air in the cabin was becoming. Now it was no longer possible to ignore. Mitford opened the valve to their last oxygen tank.

"We're coming down just in time," he remarked. "A few hours longer and we would have died of suffocation."

Young Barton was now coming to, and a few minutes later Mrs. Downer also revived. Hartley explained everything that had happened, for the professor was still busy with his observations. The six humans were unutterably happy, for they were soon to feel the soil of Earth again beneath their feet; the soil of the world which they had given up as irrevocably lost to them.

Half an hour later they were but a hundred miles above the ground. Each minute of their plunge they were accelerating, for as their distance from the earth decreased its pull became stronger. Suddenly they were aware of a loud hissing noise. For a moment they were puzzled, then with horror Hartley realized its source.

"There's a leak somewhere," he cried, "and our air is escaping into space!"

Frantically they searched for the leak. Finally they found it; a tiny hole in the wall near the rear of the cabin, evidently caused by the tearing effect of all the strains the frail little ship had been under in the last few hours. Hartley flung his coat against the opening; the pressure of the air still remaining inside the cabin was enough to hold it in place. A large part of the life-giving fluid had escaped.

The minutes dragged by. The little group was no longer happy; they watched anxiously for other leaks to appear. Counting minutes until they should be safely within Earth's protecting blanket of air made each minute seem a century. More oxygen than they realized must have escaped, for the air of the cabin felt hot, and stuffy, and oppressive.

The beckoning shelter of the ground was now less than fifty miles below. Already the plane was in the tenuous upper regions of the atmosphere, though of course it was by no means dense enough at this great height either to support life or to allow the propeller to take a grip.

To the intense dismay of everyone, a second sudden outburst of hissing heralded another leak. This one was easier to stop, for even the slight pressure of the thin atmosphere retarded the outrush of the air from the cabin to some extent. But no sooner was the second leak stopped than a third appeared.

The six frightened people gave way to sheer dismay. To be so near safety and then to see it snatched out of their reach was maddening to the extreme. Nearly all the air in the cabin was gone. One by one the helpless men and women collapsed in a heap on the floor. The ground was but ten miles below them now; three or four minutes at the most and they would be in air dense enough to breathe. But would that be soon enough to save them? It takes an incredibly short time for the absence of air to kill human beings.

Hartley and Witherspoon were the last to faint.

"Quick, smash the windows!" Hartley cried, his breath coming in heaving, painful gasps.

Witherspoon looked at the other in amazement, but there was no time for argument. Accordingly, with their last bit of strength, they set about smashing the strong glass windows, using anything they could find for the job. The aviator, being used to breathing at great altitudes, was not surprised to find himself the only one still on his feet, as Hartley fell nearby. But the next instant he, too, succumbed. His head seemed whirling in great circles, his pulses throbbed and pounded, his every breath was a gasping torture. Then everything went black. He felt as though he were

drifting into a bottomless pit, as oblivion descended upon him.

The plane plunged ever faster towards the rough surface of the earth. Perhaps a full minute elapsed from the instant Witherspoon fell to the instant the plane reached the four mile altitude. Here the air, though still rarified, began to be breathable. The precious oxygen rushed in each of the smashed windows, yet no one stirred.

● Still the unguided plane rushed downward. Very soon only one mile separated it from the hard ground. Only then did Witherspoon manage to sit up. There was a constriction across his chest, and a queer buzzing in his head. As memory returned, he realized he must check the headlong rush of the plane before it crashed, if human life was to continue on Earth.

He struggled painfully to the pilot's seat and managed to get the motor started. As the full-throated roar burst forth, Hartley and young Barton recovered their senses. They murmured a prayer of thanks when they learned how close had been their race with death. Then the three of them set to work reviving the other three, while Witherspoon leveled the plane off at three thousand feet.

When everyone had been brought around, and they were all somewhat rested, a consultation was held. Upon finding that they had gas for only a few more hours of flying, it was decided to use all of it before landing, in searching for the most suitable place to begin life anew.

It was a strange new world they found; a world which contained nothing familiar to link them with the world they had formerly known. The near approach of the moon had pulled the surface of its mother planet asunder. Great ridges and craters marred the ground. Vast layers of rock that had lain deep below the surface since the morning of Time were now exposed.

Gone were all the old boundaries; gone the continents. The contours and locations of the seas had changed. High places were now where formerly were valleys and oceans. Oceans and valleys occupied the sites of mountains. It was utterly impossible to orient themselves by the landscape, for there was nothing unchanged.

Gone also were the countless millions who had lived on the green planet. The vast tidal waves that had swept around the world during the upheavel had carried away all animal life that had not been destroyed in the great earthquakes. The waves had totally obliterated all the works of man. The ruins of not a city, not even of a single building remained to give evidence of the existence of mankind.

Vegetable life alone remained on the earth. Fire, earthquake, and flood had not been able to totally destroy this tenacious form of life. A few green things were making their appearance in the slimy valleys of the newly washed world.

The little party finally picked a small, fertile valley, somewhat cleaner and drier than the others they had seen, as the site for their new home. They landed, as the fact that they now had fuel for less than a half an hour of flying precluded further exploration. Except for the extremely remote chance of their being able, during the short span of their lives, to find and extract oil from the ground, these seven people were now doomed to live their remaining days in the relatively tiny portion of the world encompassed by this pleasant little valley and its immediate surroundings.

These seven were starting over. The slate was rubbed clean. They and their children would soon lose all track of the former knowledge of their recent ancestors, in their constant struggle to eke a bare existence from the soil. But in time mankind would again branch out to all the corners of the planet. In time, by slow and patient toil and discovery, a new and mighty civilization would be built up, just as the one before it, which had been swept away in a few brief hours by the irresistible forces of nature.

In time, perhaps, animal life in myriad forms would again make its appearance. It must begin, as in dim ages past, with crawling things in the ooze of the sea bottoms. Then it must emerge slowly through the water to the land. Thousands, even millions of years are required for nature's tedious progress. Even so, all forms of life might eventually evolve again upon the still-young world.

Life is persistent.

THE END

Three Poems

by Clarence Edward Flynn

THE DEAD WORLD

It grew a little brighter in its place
Six months ago. Its brilliancy increased,
Until it was a flaming torch in space.
Then shorter grew the blaze, until it ceased.
Now it rides, pale in ashes, on its way,
A reminiscence of a time that's o'er,
A haggard memory of yesterday,
A ghost of things that were, and are no more.

What hopes went out in conflagration there?
What loves ceased when that torch was kindled high?
What judments fell? What prospects young and fair
Were blackened in that smoke smudge in the sky?
Although of much that ghost world be the tomb,
I know much has survived its scorching gloom.

THE ROBOT

The robot of civilization
Is seated today on his throne.
His fingers of steel rule the nation,
And his is the scepter alone.
Food, raiment, amusement, and pleasure,
All that is a part of the scene,
Yes, even the dole of our treasure
Is handed out by a machine.

The robot of civilization
Decrees that tomorrow will bring
The ultimate mechanization
Of every process and thing.
We shall teach, we shall heal, we shall labor,
By devices effective and keen.
We shall even get on with our neighbor,
Love, hate, live, and die by machine.

Men of the Dark Comet

(Continued from page 57)

looking exactly like a school of fish seen through still water on a summer's day. So peaceful did those still, slender shapes appear that it was difficult to believe they constituted a menace to the people on the ground below.

"Our weapons are so feeble," muttered one of the crew, "it seems to me that our rockets themselves are our only means of striking an effective blow. After seeing the gash they tore in the ground—"

" 'Ow are we going to get close enough to aim? We should 'ave to go so fast as to miss 'em by 'undreds of miles." Thus a comrade.

"What I say is," went on the first, "to barge slap through the middle of 'em, then, while they're all round us, fire the tubes blindly every way at once. Bound to 'it some of 'em."

"You think," queried Heathcote, "that would be sufficient to cripple any vessels we happened to be lucky enough to hit. Yes, I think so myself. The trouble is that we should almost certainly be ourselves annihilated by a collision with one of the enemy; and, while I know we are all prepared to face that, there would still be enough of them left to conquer the earth."

At this the tall figure of Boddington, who had been staring in dreamy fashion at the ceiling, stirred, and spoke.

"I have been listening to your plans, gentlemen, to see if you have any better suggestions to put forward than the one I am about to make. The scheme of using the rockets as weapons is good, but I think mine is still better, and even if I fail, yours can still be tried.

● "Before I left the dark comet the people who inhabit it, I had become very friendly with them, installed in this vessel a weapon for use in this very war, and instructed me in the use of it. I require six assistants for its operation, which is the reason why I asked for six volunteers. We have already had a lesson in how efficient the machines of those people can be in the surprising effectiveness of their rockets. Shall we try it?"

Wondering, the men agreed.

"I must ask, captain, that I be in sole charge of the ship for a time. Everybody will follow me." With these words he led them to the floor below, where all were obliged to wear magnetic shoes to get about in comfort. Here was a row of six machines, each about four foot in height, and housed in green metal.

"You thought this was part of the gravity adjusting machinery, didn't you, Heathcote?" Taking a gray brick out of a metal box securely clamped in a corner of the room, the tall man pushed it into the machine through a door in its side. It struck against something with a clear, ringing sound. Then he fiddled with various handles, and a dull throbbing filled the room.

He now became intent on a metal sheet in front of him, shouting out numbers from time to time. "All set," he announced at last, "now you can all come and see for yourselves."

Looking over his shoulder they saw, mirrored on the smooth surface, a picture of the edge of the earth with the Martian vessels poised, motionless above it, and a brilliant white spot glowing in the space near them.

"That is where my ray is focussed: although it shows so clearly on the indicator, it cannot be seen outside, and only ourselves are, so far, aware of its presence. Watch."

As he moved two tiny dials the spot moved until it hid one of the enemy ships from view: instantly there was a blinding flash of light as the sides of the ship reflected back the light for a few seconds, a puff of red, then nothing remained but a cloud of gas.

"One of the devils gone," shouted a mechanic.

Hardly had he spoken before another had gone the way of the first. Under Boddington's guidance the moving finger that must have been terrifying to its victims in its inexplicability and its almost instantaneous destructiveness raced over the screen.

The startled ships began to dart, like frightened fish, in all directions; but their fate was inexorable.

"What frightful ray was that you were using?" asked Heathcote, "to be so amazingly destructive over a distance of thousands of miles?"

"Nothing more than the light and heat of our old friend, the sun. Those comet people understand radiation to an extent we cannot hope to equal until thousands more years of evolution have passed. This machine produces a field of force, partly magnetic in character, which has the property of refracting light and heat in much the same way as glass, water, gas, or any transparent material does. This field of force, extending round us for hundreds of miles and being thickest in the center, focussed the rays of the sun as a huge burning glass would. It is a weapon against which nothing can stand, as the tremendous force it uses is nothing to that it controls. You will find that brick of fuel I used somewhat smaller now: part of its substance has been entirely converted into energy. Unfortunately some of our victims fled across the earth, and we have caused some damage there, but it could not be avoided. Now let us give the planet, Mars, itself a lesson."

They went on to a point between Mars and the sun, and, using a field of force tens of thousands of miles across, focussed it to a diameter of a hundred miles on Mars. One of the men was kept busy feeding brick after brick of fuel into the machine. On the surface of the planet, as seen in the viewing screen, appeared wide, wavy lines of black running round and round the planet as it turned with its own motion: as the heat spread through the globe the polar ice-caps dwindled rapidly. Frantic appeals to stop reached them, and finally they learned that earth had accepted the Martian peace terms.

"The job is done," said Boddington, "and now I have one more thing to do." Taking a heavy spanner, he smashed the most intricate parts of the machine to fragments. "That," he explained, "was in pursuance of the promise I had to give before I was allowed to have the weapon.

"Now to return. Messages we have received from the provisional governments of earth tell us that a grateful people have transferred a large amount of international credit units to each of us. Heathcote and I, and to a lesser degree each of you, are now wealthy men. Personally I shall accept but little of their gifts; for I do not intend to return to earth, but am going to get a party together and spend the rest of my life exploring the Solar System. Who comes with me?"

All six men offered to accompany him.

"Myself," said Heathcote, "I shall return to my family and continue in my old job as space captain."

The Final Triumph

(Continued from page 39)

off as they reached the same definite area. They reformed, slammed at full speed at the invisible barrier, only to jerk violently out of their course.

Perrin swore sharply. Sputtering reports from bewildered aviators brought uniform accounts: A wall of force held them off; unseen, yet impenetrable as steel. They skirted the barrier with impotent rage.

The general set his teeth. Gun crews swung into action. A battery of field guns, long smooth snouts uplifted, loaded and primed, waited the signal.

"Fire!"

Artillery officers pressed electrical firing contacts.

Nothing happened! The great guns rested, cold, inert.

Perrin swore luridly. An apologetic major was trying to explain: "All our electrical equipment is dead. It is being blanked out by some sort of wave. Those men are devils, sir!"

"Devils or not," the general ground out. "We'll see if they can stand cold steel."

A great cheer burst from the troops as the orders were given to advance. They moved forward in great surges, bayonets gleaming wickedly in the sunlight. It was a long hard march through unbroken wilderness—the tanks had to be left behind—but the men sang and whistled the latest Broadway hits with great gusto. It was all a lark to them—this handful of scientists making monkeys out of high-hat aviators and snooty artillery. The navy too, had found its firing equipment out of commission. Lowly, sweaty doughboys, they were the guts of the army. The other branches of the service had had to call on them for help.

At two miles halt was ordered to reform in the woods. Open skirmish formation. Then, with a huge swelling cheer, they went forward at the double quick. A quarter mile, a half mile; no opposition, nothing but the oppressive noises of the forest. The thunder of the surf. The base was only a mile away now.

The soldiers pressed forward eagerly. The woods resounded with the crash of underbrush. Someone tripped and fell. He was a little ahead of his fellows. A sergeant turned to curse his clumsiness, went headlong. Someone shouted something, and collapsed, his rifle making a dull thud as it collided with a tree trunk.

By now the whole first line of troops was down, silent khaki bodies sprawled against the brown pine needles. Perrin, hurrying forward, took in the situation at a glance.

"Electrically charged wires," he said bitterly. "Damn them; they've thought of everything. Wire-cutters, advance!"

The veteran company came forward, clad in insulating gloves, carrying huge steel wire-nippers. They went to work with a will, seeking out the innumerable fine strands, snipping them in two. An hour of hard grueling work, and the captain reported to Perrin.

"It's no use, sir; there's millions of them, hidden all over the map. We've only cleared up a few yards, and half my men are down. At that rate—"

At that rate, the general thought bitterly, he'd lose his whole command. He ordered a halt. No use killing off men uselessly. He sent a code radio to Washington explaining matters, asking for orders.

The answer came back almost instantly. Claremont, back at the field base, had already kept the ether sizzling.

"Withdraw troops at once to field base," the order read. "Leave Colonel Wills in command. Report at once to Washington. Bring Claremont with you."

● The rest is history. Every school child of this new era can recite it by heart.

Every one of importance was present at that last great conference in Washington. High government officials, senators, financiers, bankers, big business men, generals, admirals.

There was no time for endless talk. Decisions had to be made instantly. The whole country had seemingly gone mad, electrified at the spectacular resistance of the scientists, a handful of men, against the assembled might of the government. The fallen troops, it was discovered, were not dead. The current had been merely a paralyzing current, numbing its victims temporarily.

The nation was in revolt, a mass movement of almost a hundred million people. The captains of industry, scared and panicky, were willing to yield everything. They feared the temper of an aroused people.

The President took a firm grip of the situation. Secretly, he was somewhat glad at the turn of events. He had been swept into office years before as the exponent of a new deal. For the first few months the country had listened to him as to a prophet, acclaimed the vigorous steps he had taken to drag it out of the morass of depression. Congress, bankers, business, had unwillingly lagged along, even when he struck boldly for radical measures.

Then the tempo slowed. Three months had passed, and still there was a depression. People muttered, not realizing that the illness had been deep-seated, took time to cure. Big business recovered from its initial fright, fed the rumors of discontent insidiously, thrust unseen monkey wrenches into the machinery. The President felt the change, but could do nothing. All his fine plans were askew. He relapsed wearily, and waited. The wheel was turning again now; the Technocrats furnishing the power.

He acted. Safe conducts were furnished to Roode and Grace. They appeared at the conference. All that day and the next they worked to come to an agreement. News came that the Middle West had set up a Technocratic State. Other sections of the country were on the verge of similar action.

That put an end to further bickering. A plan was evolved. The democratic form was to be maintained with President and elective Lower House. The Upper House to be elected by unit divisions of the industries. The Technocrats, augmented to include a thousand of the greatest engineers, scientists, technicians, economists of the nation, to be put in complete control of industry.

A nation-wide plan of production and distribution to be put into effect; no man, woman or child was henceforth to lack the necessities of life.

The terms of the compact were broadcast to a listening nation, and the televisor units disclosed the President of the United States and Adam Roode sealing the agreement with a hearty handshake of mutual respect.

The new day had dawned!

THE END

The Radio Terror

(Continued from page 19)

M. Perignon approved:

"Parbleu!" he said, "evidently an atom dissociated into its electrons is not destroyed any more than a piece of sugar that has been dissolved in coffee. Only a madman could dream of the destruction of the world."

Paulette, delighted at this approval, went on:

"Certainly. Matter once dissociated, resolved into its simplest form, which is energy, would simply reform in another shape, and that's all."

The marquis seemed pensive:

"But," he objected, "if I understand what you are saying, mademoiselle, if one dissociated matter, it would simply result in the creation of a new world. Faith, the one we are living in is so poorly made, that it's almost worth the trouble of doing it to get a new one."

And he added, laughing:

"Don't you think so?"

● There was no echo of his gaiety. Paulette had a sensation that his laugh had something grating and unpleasant in it. And that voice, with its curious vibrating inflections, where had she heard it before? She felt a disagreeable impression, as one does in the presence of people one detests instinctively.

She watched the marquis slyly from the corner of her eye—an art which all girls possess from the cradle upwards. The result rather astonished her. He radiated an atmosphere of superior intelligence; his eyes yielded to no one's. But there was something vaguely antipathetic about him.

All at once Paulette found the key of it; the emotion he aroused in anyone who looked at him was fear.

But the doctoress was speaking:

"Well, you can make your new worlds in the laboratory if you wish. I admit that I did not find the remaking of this one a pleasant affair. The darkness that came on the city last night found me at the door of a client with no way of getting in."

"And you, my dear senator?" asked Mme. Reynier-Vitral.

"The Senate was in session at the Luxembourg, Madame. We simply waited calmly, for it is the duty of the French Senate to give an example of calmness to the world."

The Marquis suggested: "You didn't even try to telephone home?"

M. Moutonneau admitted:

"We did think of it. But the telephones weren't working."

"And at the Chamber of Deputies?"

"Peuh! They say that some of the deputies were really terrified."

"Oh, the deputies," said the doctoress, "they're young. The senators for my choice." And she smiled archly.

Then, she turned toward the marquis:

"And you?" she said, "what did you do about those uncomfortable phenomena and the threats on the radio?"

Paulette glanced at the man thus addressed:

"Me, madame?" said the marquis, "I am desolated to admit it, but I saw nothing. I was in the Bois de Boulogne. At a certain moment it seemed to me that it became a trifle chilly, and I came back to Paris too late—like the police. The show was over."

"You didn't even see the discoloration of the atmosphere? It was really superb."

The marquis replied drily:

"No, madame. I missed the whole thing."

He put into that simple phrase a certain intonation of profound distaste, almost of anger. But he recovered with wonderful quickness, and added in a tone too lively not to be sincere:

"It's queer. I, who saw nothing at all, I am more astonished than you who were in the middle of Paris. I see the whole thing less clearly than you, Mme. Brasseur, in front of your client's door in the dark. The events of yesterday seem so incomprehensible. And what is queerer still is the way everyone talks about it. Look—I'm not dreaming am I? I'm really in a circle of the greatest scientists of France? Well, when they told me about yesterday, I thought they were having a joke at my expense. I said it was impossible. Now you others, ladies and gentlemen, you are scientists, you say that it was possible, and you add, if I understand aright, that it was simply a sort of laboratory joke. Is that correct?"

"Faith," said Perignon, "hardly. I think as you do—it was impossible."

The marquis smiled. But it seemed to Paulette that his color changed.

The senator remarked in a serious tone:

"It's a good thing you came to this reception. Now, if the world does come to an end, you will understand why."

"You are right, my dear senator. As you say, I'll understand why next time. I'm glad I was a boyhood friend of the Minister of Science. For he certainly did not invite me here because of my knowledge."

And in a new burst of his mad humor, the marquis went on:

"Then the only thing certain about it is that yesterday some millions of human beings were convinced that they were about to perish. Unfortunately, most of them were unable to see the senators giving an example of calmness to the world. Well, since we have arrived at the moment for confidences, perhaps Mlle. Gribal will tell us her impressions?"

It was said in a perfectly natural manner. Paulette, carelessly—for why should she be on her guard—replied with her ordinary frankness:

"Mon Dieu! I was more interested than disturbed, I assure you."

"Brave child!"

"My brother jokes all the time. And he was particularly amusing when he put on mother's old coat to protect himself against the cold. And we were all very much reassured when father arrived with his little lighted lamp."

The marquis gave a start of surprise so marked that the others gazed at him.

"Ah!" he said, "your father—"

"Father had a helium lamp that M. Mazelier gave him. And then, it was M. Mazelier who explained to us that the red light was not caused by a big fire as we thought."

"Ah!" babbled the marquis, "that Monsieur Maz—"

● He did not finish his sentence. His smile gave place to a kind of convulsive and horrible grin, and he became so pale that the doctoress said:

"Do you feel ill?"

But the marquis was not one of those who is so easily overthrown. He bowed to Mme. Brasseur:

"It is a trifle warm here," he remarked. "Thank you, madame, but I shall not need your help this time."

At this moment an eddy of the crowd formed around the entry of a woman whose extraordinary beauty caused a murmur of admiration to arise as she came in. It was Mme. Ghislaine Roberval, the widow of the celebrated inventor who had produced the electric automobile that was driving gasoline cars from the market.

She entered the salon at the precise moment when someone was saying to Gribal:

"Mlle. Paulette is making conquests."

"Yes?" he answered, non-committal but flattered.

"Her conversation seems to have drawn to her the most intelligent and fashionable man in Paris. Don't you know him? It's the Marquis de Saint-Imier."

The name struck Gribal like a flash of lightning. He excused himself to seek his daughter, all unsuspicious of the danger she was in. Or was it already too late? Had Paulette already said more than she should?

(To be Continued)

Captive of the Crater

(Concluded from Page 25)

The moon surface unfolded. Probably ten miles remained between him and the crest of the mountain at whose base the shaft opened. The ship steadied down to a straight away dive with power behind it. Lewis looked again at the moon's surface, swelling up to meet him. Pike was crazy, mad! Even if the *Moon Bird* overtook him before he reached the shaft, it was coming too fast to alter its course. Those ragged pinnacles stuck up like shark's teeth all around.

The ship had no more than halved its distance from him when the moon's surface was barely half as far away. It would be neck and neck, both Lewis and the ship gaining speed every second. Pike must stop! He was placing every life aboard the *Moon Bird* in peril! Another thousand feet would be too late!

Lewis wigwagged an order. Pike disregarded it.

The shaft opened up, black and wide. The ship crowded on. Lofty peaks and pinnacles were reaching up. The *Moon Bird* was already in their maw!

Lewis dropped from sunlight but could still see the gray, glistening ship as it headed down. She was fairly leaping with power. Darkness shut out everything and then a circle of light from the nose of the ship. Gray walls all around whipped upward from the light. The ship's nose touched him. He gripped the rail of the catwalk and hung on.

Anxious faces pressed against the port glass, but Pike, himself, calm and level-eyed, sat in the transparent cab seeing nothing but the unfolding tunnel. Those walls were a menace from all four sides. Pike was driving for the safety of the ship.

Lewis was anxious to get inside the ship so he dragged himself along the catwalk to the vacuum chamber. He entered it and signaled for the air pressure to be raised.

Inside the ship the men went wild, all but Pike, who seemed more a mechanism than a man as he drove the *Moon Bird* down that two thousand mile tunnel of Luna.

Some hours after, Lewis, Pike and the crew were out of the shaft and all had caught up with their sleep, the *Moon Bird* volleyed away from the moon surface and straightened out for earth.

"What do you suppose made that smooth-walled crater?" Lewis queried of his friend. "Of course the moon is porous and the task was small compared with one on earth of similar proportions, but why do you suppose the walls were so smoothly laid?"

"I've thought of that," Pike answered, "and we found something that reveals a good deal. Beyond the shaft on the depressed side is quite a large city still protruding through the fall of meteorites and ash. While waiting for you we found some machinery, ancient to be sure, but still in a fair state of preservation. Of course there will never be any more decay to anything on the moon's surface, but this machinery evidently dated back to a time when there was water in the depression. There is a much deeper sink beginning less than a mile from the city. It is my idea that when all the water from the great depression was finally drained into the shaft and pumped from the other end, a city sprang up here to use and pump the water from the lowest basin.

"You see, Lewis, my idea is that they dug this shaft from the crater on the earth side of the moon to tap the great lunar sea on the other side, which was probably fresh water. They must have sacrificed thousands of lives, when the final excavation was made, for the water would naturally rush to the far side of the shaft to seek a level with the water in the great depression. At first that was probably high enough to put the water quite near the surface on the other side of the moon. This condition no doubt existed for many thousand years."

"You've got a great imagination, Pike," Lewis said with a tolerant chuckle, "but how do you account for the smooth walls? The moon is porous and water falling over the walls could hardly have filled them top to bottom with solid rock."

"Proving my point," Pike insisted, "That wall is masonry. The moon creatures probably knew that if they did not wall in the shaft the water would be wasted in the giant caverns of the interior."

"Proving my point, also," Lewis laughed outright, "You've got a great imagination!"

THE END

Science Questions and Answers

This department is conducted for the benefit of readers who have pertinent queries on modern scientific facts. As space is limited we cannot undertake to answer more than three questions for each letter. The flood of correspondence received makes it impractical also, to print answers as soon as we receive questions. However, questions of general interest will receive careful attention.

The Age of the Earth

Editor Science Questions and Answers:

What is the generally recognized age of the earth; and how is it calculated?

Warren F. Field,
San Francisco, Cal.

(Many people and groups have taken a hand in calculating or pronouncing on the age of the earth. The ancients used figures ranging from two to four million years, except for the Brahmins, who held that the earth was eternal. No scientific estimate was made until the rise of modern geologic science at the end of the eighteenth century, when it was based upon the time necessary to deposit the stratified rocks. Lord Kelvin, the physicist, made, at his time, a new high estimate of 40 million years since the earth was a molten globe.

In 1899 July proposed a calculation based upon the amount of sodium deposited in the oceans each year and the total sodium now in the seas. His figure further increased the earth's age to 91 million years.

With the development of our knowledge of the radioactive metals the "uranium" clock has been established and is now generally accepted as the most accurate that we know. It is known that an atom of uranium ultimately turns into eight atoms of helium and one of lead. It has been found that a million pounds of uranium yields 1/7600 pounds of lead per year. Lord Rayleigh in 1921 said that the disintegration of radium "could be relied upon to have been the same in the past as we now observe it to be." If we calculate the lead present in any uranium bearing mineral we can determine the length of time it has taken to produce it. From such data it has been calculated that the age of the earth cannot be possibly less than 1,600 million years, a considerable increase over previous estimates. Another estimate by the uranium clock, taken from a deposit of uranium-radium ore in Russia gives an age to the earth of 1,852 million years. Naturally these are minimum estimates, and it may be possible to find another clock that points to an ever greater age for the earth. Obviously millennia must have been necessary for the cooling of the earth, before even uranium could be formed.—Editor.

The Size of a Molecule

Editor Science Questions and Answers:

Would you tell me through your excellent columns how large a molecule is?

C. R. Bradford,
Nashville, Tenn.

(There is nothing that we can see with the naked eye that we can use as an indication of the size of a molecule. We can only give its size in inches and then use analogies to convey the order of its smallness. If we had a cube 1/1000 of an inch on an edge it would be invisible to the naked eye. Yet in this cube there would be in the order of 15,625,000,000,000,000 molecules.

In order to appreciate the size of this, let us assume that each molecule were raised to the size of a grain of sand, say 1/32 of an inch in diameter. How large would our cube be that contained 15,625,000,000,000,000 molecules? It would be a cube 650 feet on an edge. Let us assume that each molecule were as large as a ball 3" in diameter. Then to contain the above number of molecules would take a box 10 miles on an edge.—Editor.)

Carbon Monoxide Poisoning

Editor Science Questions and Answers:

I have read of a number of cases of carbon monoxide poisoning, in each case the victim being apparently unaware of the gas and dying quickly. Could you explain how the gas affects the body to cause death?

Homer Byng,
Charleston, S. C.

(Carbon monoxide, known to the chemist as CO, kills by its ability to form a combination with the hemoglobin of the blood and thus deprive the tissues of oxygen. In other words, it prevents the hemoglobin from carrying oxygen to the nerve and muscular fibres, its action being so effective that death follows on the inhalation of relatively small quantities. The effect depends not only on the amount breathed, but the time of exposure to it, the effect being cumulative. Since the gas is colorless, odorless and tasteless, no warning of its presence is found. Henderson and Haggard, two investigators, estimated that three parts of carbon monoxide in 10,000 is the maximum permissable in atmosphere to which men may be exposed for several hours. The gas is eliminated from the body in the form of the unchanged monoxide, and through the lungs, where it enters. Many deaths that occur from carbon monoxide are undoubtedly caused by the victim being made unconscious through the early inhalation, and remaining in a carbon monoxide atmosphere until he is dead.

Sir Humphrey Davy early in the eighteenth century, in order to determine the effect of carbon monoxide on the human organism, inhaled some of the gas himself. He filled a bag with four quarts of "hydrocarbonate" which is hydrogen and carbon monoxide, made by the passing of steam over charcoal. As he describes it, "after a forced exhaustion of my lungs, I made three inspirations and expirations of the hydrocarbonate. The first inspiration produced a sort of numbness and loss of feeling about the chest and pectoral muscles. After the second inspiration I lost all power of perceiving external things and had no distinct sensations except of a terrible oppression on the chest. During the third expiration this feeling disappeared, I seemed to be sinking into annihilation and had just power to drop the mouthpiece from my enclosed lips." Davy's blood at that time was probably half saturated with the gas.

To resuscitate from the effects of carbon monoxide, oxygen is administered with 5% of carbon dioxide, which is to stimulate the respiration, causing deeper breathing. If the heart has not yet stopped beating, such resuscitation is effective.—Editor)

Mysterious Algol

Editor Science Questions and Answers:

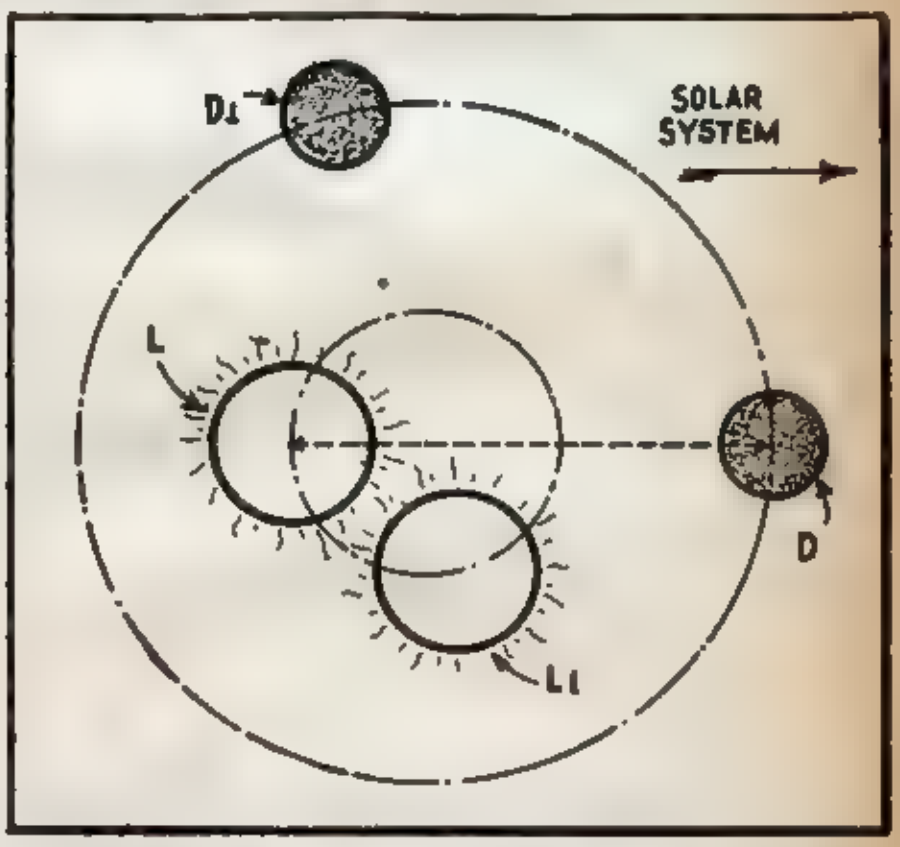
I would like a little data which you possibly can give me about the Demon Star, known as Algol.

Some astronomical authorities state that this is a double star, one component being much brighter than the other, while others have stated that there are THREE bodies, one a true sun, the second a dark body almost as large, both revolving about each other and the pair in turn revolving about a dark body much larger than the other two combined. The late Garrett P. Servis, in a Sunday newspaper article published about thirty-five years ago, is the authority for the last named theory. For the sake of a projected story, I hope that his statement is correct, but I am asking you to give me the latest data if possible.

W. Eldridge,
Houston, Texas.

(According to Harold Jacoby, professor of Astronomy, Columbia University, writing in his book, "Astronomy," Algol is a form of variable star, whose brightness changes in a rather periodic fashion. Algol appears, as a matter of fact, to undergo a partial eclipse and, continues Prof. Jacoby, "it was not proved successfully until 1889 when Vogel successfully observed the spectrum according to the Doppler principle. He showed that the visible star Algol has a velocity of recession before its period of minimum luminosity, and an equal velocity of approach after such minimum. The explanation now postulates a dark but massive companion to the visible star, and both revolving in nearly circular orbits about their common center of gravity. The orbit plane is supposed to be directed toward the solar system, so that we see the orbits edgewise.

(Continued on page 96)



Showing how Algol (Beta Perseus) appears to vary in its light intensity periodically. Algol is composed of a light (L) and dark (D) part, being a double star. When D eclipses L as seen from the solar system, the light from L falls to 1/3 of its former brightness. When, however, they are in the position L1 and D1, L is seen in its full glory. The period of variability of Algol is some 2 days and 21 hours.

READERS

If you like "Science Questions and Answers" in this magazine, you will find in our sister magazine, EVERYDAY SCIENCE AND MECHANICS, a similar department, greatly expanded called "The Oracle." Look for it, you science fans!

IN THIS department we shall publish every month your opinions. After all, this is your magazine and it is edited for you. If we fall down on the choice of our stories, or if the editorial board slips up occasionally, it is up to you to voice your opinion. It makes no difference whether your letter is complimentary, critical, or whether it contains a good old-fashioned brick bat. All are equally welcome. All of your letters, as much as space will allow, will be published here for the benefit of all. Due to the large influx of mail, no communications to this department are answered individually unless 25c in stamps to cover time and postage is remitted.

The Shock of It

Editor, WONDER STORIES:

Please accept my best wishes for the splendid *renewal of the great large size and 25c* issue of WONDER STORIES! The April issue was simply superb, and contained the best array of stories that you could possibly have published.

"The Revolt of the Scientists" by Nathan Schachner took first place for its excellent notion and smooth description. Mr. Schachner is one of your most capable authors; never let him go, never!

"The Fatal Equation" by Arthur G. Stangland claimed second place for originality and style.

"The Light From Beyond" by Clark A. Smith held third place for charm and adventure. Mr. Clark has only to write but what he produces [illegible]!

Next in line came "The Forgotten Man of Space," "Giant in the Earth," "The Man Who Awoke," "Moon Mines," and "The Dimension Twister," all excellent!

Please, however, don't use any Illustrator but the superb, the incomparable, *the magnificent, the Paul!* Any of the works of the other illustrators do not make quite so nice a showing.

Fred J Watson,
Denver, Colo.

(Pardon us, readers, but we really cannot get over the shock of a body of readers so loyal as to uniformly congratulate us for raising the price. Here today, when a mad drive is going on to reduce the costs of everything .... well, it's a pleasant shock.—*Editor.*)

The Irrepressible

Editor, WONDER STORIES:

I was very much pleased when I received the *April issue of my favorite magazine containing more pages* and greater variety of stories. WONDER STORIES as it is now is well worth the price charged for it. Keep up the good work.

Nine good stories of science fiction! Here they are listed in order of merit.

1. "The Revolt of the Scientists." Here is, what I hope to be, the first of a fine series of stories concerning the same characters. Here is the end of the Liquor Racket. What next?
2. "Moon Mines." A new author. A fine tale. Come again, Mr. Binder.
3. "Master of the Brain." You can be sure that I was happy to see the second of this series so soon. The first story was great, but this one is even greater 'Nuff said.
4. "The Fatal Equation." I haven't yet read a dull story by A. G. Stangland, and this one is no exception. It is one of his best.
5. "Giant in the Earth." A "different" story
6. "The Forgotten Man of Space." I wish that Mr. Miller would write more often for us.
7. "The Light From Beyond."
8. "The Moon Doom."
9. "The Dimension Twister."

Some of the best stories you have published were serials, so please return to them. I'll never forget such serials as "The Human Termites," "A Rescue From Jupiter," "Exiles of the Moon," "The Time Stream," "Brood of Helios" and other great serials.

WONDER STORIES has outlasted the depression so far, which is more than other magazines have done. I hope it will never be forced to suspend even one issue. May the circulation of our magazine triple before the year is up.

I suggest the following changes on the cover

1. The title WONDER STORIES in block letters directly on the background of the picture.
2. Omit the band from the top of the page.
3. Have a greater variety of colors for the background of the picture.
4. Display the names of well-known authors prominently.

Other suggestions: Please have the entire magazine illustrated by PAUL. He can't be beat. Now that the magazine is enlarged, how about pictures of the authors? Don't keep us in suspense. Tell us what to expect in the next issue.

Jack Darrow,
Chicago, Ill.

(We have had so many ideas for changes in the magazine submitted by the irrepressible Mr. Darrow that some day we are going to get mad and use one of them. For several years Mr. Darrow has not missed a month in giving his comments destructive and constructive on the issue. We don't know what we would do were he to miss an issue.—*Editor.*)

Beginning the Fifth Year

Editor, WONDER STORIES:

For a long time I have been wanting to write to you, so here goes. *I think the larger size and higher price is far nicer than the smaller, depression or no depression.*

Although I think you print the best science fiction stories in general, I don't think that any magazine has a monopoly on all types of stories from a quality standpoint. There are other good science fiction magazines on the market, and they print good stories also, some good, some so-so and some terrible. As a matter of fact all of them have this fault. But I honestly believe that you print the best stories on the [illegible]

I think Paul is the best illustrator for covers, anyway. He seems to gather from the stories the most interesting scenes and in the manner they are imagined to be by the reader.

In an issue or two you will be embarking on your fifth year of publication of WONDER STORIES and we, the readers, hope it will be as good if not a better year for you. We hope that the past standards will be maintained in regards to illustrations, stories, and general appearance of the magazine.

In the last few issues you printed a story by Lawrence Manning entitled "The Wreck of the Asteroid" which was in my opinion one of the best of the stories printed in the last year I think that the story by John Taine, "The Time Stream" takes the prize for the last two or three years. I have also enjoyed very much stories by Richard Tooker, P. Schuyler Miller, and others.

ON LETTERS

BECAUSE of the large number of letters we receive, we find it physically impossible to print them all in full. May we request our correspondents, therefore, to make their letters as brief and to the point as they can; as this will aid in their selection for publication? Whenever possible, we will print the letter in full; but in some cases, when lack of space prohibits publishing the complete letter, we will give a resume of it in a single paragraph.

Once in a story in your magazine I saw the following error. (Not word for word). "An Irishman whistling his native song, 'Annie Laurie'." "Annie Laurie" being a typical Scotch ballad it was rather funny. Also I hate to see grammatical errors such as "He don't" and "She don't," it is so unnecessary.

This letter is not for publication in your readers column as don't use it please. I really mean that even if it was a good one, which it isn't.

Anyway, I'm still a supporter and a booster of your magazine and will continue to be one as long as I am able to.

I read all the s. f. mags on the market so I think I can give at least a humble opinion. Good luck to you and the mag.

"Reader,"
Seattle, Wash.

(This letter is such an interesting one, that we are using it, and hope that "Reader" will not object. Naturally it makes us feel old, worn and feeble to realize that at the end of this volume five years will have elapsed since with fear and trembling we put out the first issue of WONDER [illegible]

Five years of storm and tumult of the greatest depression the world has seen. During these five years the infant WONDER STORIES, having never known the balmy seas of plenty, was forced to weather the gales of the depression. Five years of bad nerves for everybody, of lean diets and thin stomachs. Yet five years of a certain kind of growth that comes only from lean diets and thin stomachs. Oh where, oh where, will our wandering child be a year from today?—*Editor.*)

For Raising the Price

Editor, WONDER STORIES:

I have just completed the April issue of WONDER STORIES, and I wish to congratulate you for raising the price to 25 cents and increasing the pages to the former number.

I believe that the April issue is one of the best you have issued for several months. A good assortment of interplanetary, mystery, and adventure stories contributed to its success.

"Revolt of the Scientists" by the genius of science fiction, Nathan Schachner, brings back fond memories of the good old days of Keller, Leslie Stone, Hari Vincent, and Repp. Where are the authors of yesterday? Are they stored away in the desk and archives of the Editor? If so why not bring them forth? They are the real masters of science fiction.

Let's have more science in the stories. Did the dropping of the name 'Science' from WONDER STORIES indicate the passing of the real scientific tales?

I have every issue of WONDER STORIES, from the first "Air Wonder," and "Science Wonder," through the cut size page stage, through the fifteen cent era up to the present issue. I certainly do not regret the small sum each month as I have been more than amply repaid dozens of times; not only in entertainment derived from the reading of the various issues, but also from education received from the many real scientific stories.

I, for one, would welcome the return of the "twin" WONDER STORIES with bigger and better stories! How about it, editor?

Kenneth Hitch,
Richmond, Calif.

(Continued on Page 91)

See How Easy You Can Learn HYPNOTISM

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SEE for yourself how easy it is to master the great science of Hypnotism—how quickly you can learn to bend people to your will—banish fear, worry and opposition—increase your earnings—and *force* others to give you the recognition, power and admiration you deserve. I'll show you how to use this great force to help you master every situation.

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THE READER SPEAKS

(Continued from Page 91)

(This seems to be a big month for us. Bouquets and brick bats rain about our heads in a storm. We are especially glad to note that the matter of a dime does not stand between our readers and a bigger and better magazine. Imagine being congratulated for raising a price! —*Editor.)*

The Horrid Baron von —

Editor, WONDER STORIES

I am writing cryptically (?) as I have many things to say and have no desire to waste the space of your columns. Glad you have returned to the 25c size. Think the magazine is degenerating. Suggestions to prevent this below:

1. Stop idiotic cover illustrations and attempt more artistic ones.

2. Get new artist for inside illustrations and instruct him to read story before drawing. Paul's pictures of men with mouths open are sickening. Someone suggested they are catching flies. I think they are members of the "Glee Club" singing "Burgundy." Maybe I misinterpreted them and they are really fish in market or inhabitants of Venus.

3. Instruct authors to eliminate plots where scientists' creation is turned loose on the world. First 25 such plots were all right but they are now getting tiresome.

4. Do not print such expressions as:
"Whirling vortex of flame."
"Glistening cascade of sapphire, emerald, rubies, etc."
"Infinite depths of stygian blackness."
(Keep authors from such primitive emotions.)

5. Cease accounts of barbaric warfare.

6. Limit love stories.

7. Less melodrama.

8. Publish list of at least one place in each city where WONDER STORIES can be procured monthly.

9. Less advertisements of "Sex Life" and "How to be Strong."

10. Continue discussions column—have authors respond.

Baron von Elmer Schnopsvitch,
Hartford, Conn.

(We think you are just horrid, Baron von Elmer Schnopsvitch, and it would serve you just right if a reader wrote you an indignant letter. To criticise WONDER STORIES, of all things.—*Editor.)*

Well, Mr. Schwartz

Editor, WONDER STORIES:

Well, Mr. Schwartz, they printed it; and I think they did it once before, too. You've DARED them to print your letters twice, and they've done it both times. Are you satisfied now? You should be. In my estimation Mr. Gernsback has done a remarkable job in editing WONDER STORIES, and I would like you to show me ANY Editor that could do any better. It's impossible.

I'll admit Mr. Gernsback has made several errors, but he's corrected them all when he found out that they were errors. Just take a look at the April issue. Is there anything more that you want? Nine GOOD stories, 96 pages, a good editorial, and a larger Reader Speaks. What more could you possibly want.

Both WONDER STORIES and Mr. Gernsback's former publication, are well nigh perfect. Instead of being rivals, these two should go hand-in-hand towards the great goal. Both give us the best in science fiction, and are both truly wonderful publications.

I see an illustration by Marchioni in this issue. Fine. He (or is it she) is a fine artist, but not as good as Paul or Wesso.

So keep up the good work, and I'll be a satisfied reader as long as WONDER STORIES is published.

F. Lewis Torrance,
Winfield, Kans.

(Thank you, Mr. Torrance, for those kind words, thank you, thank you.—*Editor.)*

Completely Satisfied

Editor, WONDER STORIES

This is my first letter to the "Reader Speaks" column, and I must say that the last issue was great. "The Robot Technocrat" by Nathan Schachner was swell. "Wanderers of Time," "Dweller in Martian Depths" and "The Man Who Awoke" were wonderful too I have never been disappointed in WONDER STORIES and I never hope to be. The best authors you have, from my point of view, are Laurence Manning, Otfrid von Hanstein, Clark A. Smith, A. R. Hilliard, and Ludwig Anton. I hope to read more of their stories.

Fernando Pedro,
Redwood City, Calif.

(We are always glad to hear from our readers who have never written us before. Although there are a number of "steady correspondents," there are thousands of our readers who have never expressed their point of view on stories, authors, editors, etc. We want to hear from you readers who are hiding your light under a bushel.—*Editor.)*

New Falls Asleep

Editor, WONDER STORIES:

Formerly WONDER STORIES was the cause of my losing a good many hours from my night's rest. Whenever I received my monthly copy of the magazine I could not retire until I had finished reading it.

Now I have no such complaint to make; whenever I pick up a late issue of WONDER STORIES, I can only get about half-way into the story before I fall asleep.

Wm. Hayne,
Vallejo, Calif.

(This, indeed, is a difficult case. Yet there are so many people who suffer from insomnia such as coffee drinkers, that the ability to produce sleep should be prized. Perhaps to such sufferers WONDER STORIES might come as a great boon.—*Editor.)*

Don't Attempt It Again

Editor, WONDER STORIES:

In the April issue the story "The Revolt of the Scientists" was great. However, your attempt to insert something like "The Light From Beyond" in a science mag. is humorous. Don't attempt it again; we insist upon reality not the ramblings of a Poe-like mind.

Floyd Anderson,
Racine, Wis.

(Well now, readers, do you? It seemed to us that Smith had some supporters. Or was that only the ramblings of the editors' minds?—*Editor.)*

Does It Make Sense?

Editor, WONDER STORIES:

I have just finished reading the April issue of "our swell mag." I noticed at once that we're back to two bits. That's good news or I'm a ginzie (with apologies to Rando Binder). The stories in the April issue lacked one thing—a love interest. I'm strong for science stories, but they must have a love interest to be good.

I can believe in the possibility of any kind of science story except time travel. Listen. Suppose I am doomed to die in 1943. I could jump into my time machine (assuming that I have one) travel to the year 1945 and stand over the grave in which I had been lying for two years. It doesn't make sense, does it?

Earle S. Troupe,
Minneapolis, Minn.

(As we expressed it, some time ago, the chief virtue, which we believe to be a great one, in time stories is that they give us an opportunity to see the future through the eyes of a man of the present. Time machines are painless ways to get into that future and see it. Naturally a person can't be in two places at one time. So in the classic example of that type of story, "The Time Machine" by H. G. Wells, neither Wells nor his readers were supposed to take the time machine too seriously. It merely gave Wells his opportunity to take his character on a journey through time and witness the decay and death of the human race.—*Editor.)*

Objects to Technocracy

Editor WONDER STORIES:

Congratulations for the return of WONDER STORIES to its old, aristocratic, and dignified shape, from that little pamphlet-sized booklet. Not only has WONDER STORIES returned to its old standard, but it scored a smashing victory

THE READER SPEAKS

(Continued from Page 91)

after its long losing streak. The old batting order won the day, with home runs scored by P. Schuyler Miller with his "The Forgotten Man of Space," by Clark Ashton Smith, who lifted one over the fence with "The Light From Beyond." Laurence Manning also hit a homer into the right field stands with "Master of the Brain." Eando Binder hit a smashing liner to center field for a triple with "Moon Mines," while clean two-baggers were scored with "Giant in the Earth" and "The Fatal Equation." However, much to my disappointment, H. K. Harris flew out with "The Dimension Twister," and Nathan Schachner fanned on three straight pitches. His story might have been very good, had he not ruined it by glutting his pages with the half-baked idea, Technocracy.

I consider it a disgrace to praise this foolish Technocracy. If it was ever adopted, it would destroy the ambition to "get somewhere." With the end of ambition for progress, civilization would collapse. I would place Technocracy along with many other unsound and unsafe policies such as Socialism, Anarchy, and Communism. Besides all your material on Technocracy have done nothing but praise it. If Wonder Stories continues to publish editorials like the one in the March issue, and stories like those of Schachner in the March and April issue, why will it not publish editorials by such men as Walter Lippman and others who are opposed to Technocracy.

I would like to request that you mail Wonder Stories at the first of the month, rather than waiting till the middle, as you did this time. If you require entries for that story contest to be in your hands by March 14th, why do you not mail Wonder Stories at a more suitable date. Please try to be more punctual in mailing the magazine, and try to avoid defaulting any issue until it is necessary to write and ask for the missing number. Wonder Stories has often committed that offense, but happily, not recently.

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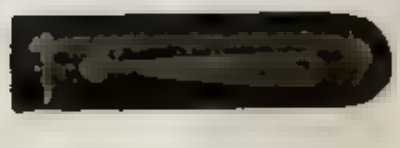

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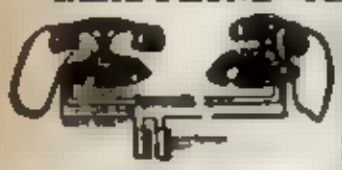

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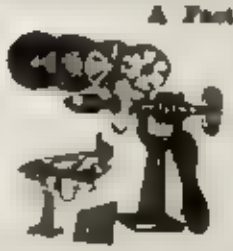

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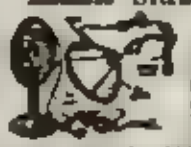

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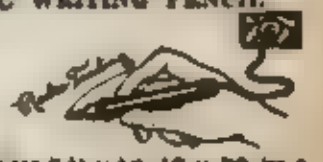

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Duty of newlyweds—innocence and ignorance—purity and fullness—getting the correct mental attitude.

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THE READER SPEAKS

(Continued from Page 91)

I now believe that Wonder Stories should be able to attain a new high standard, since one of the other science fiction magazines is out of business. Again I wish to congratulate Wonder Stories for its return to the old standard, but I believe that most of the readers object to the recent stories on Technocracy, Socialism, and other "acys" and "isms."

Bill Bailey,
Pittsburgh, Pa.

(Thanks for the complimentary remarks. We are very glad to see that you like the magazine in its present format again, but as to your idea that we are supporting or praising Technocracy, you are all wrong. Note particularly our editorial policies as to this.

If you will get recent copies of Everyday Science and Mechanics and read the two articles by the editor of this publication, also the editorials, as follows:

February, 1933, "Machine-Men"
February, 1933, "The Machine and the Depression"
April, 1933, "Inventions and Prosperity"
April, 1933, "Technocracy vs. Science"

you will notice from these, that far from praising Technocracy the editor violently opposes it. This, however, does not prevent us from running stories in the magazine because a magazine of the type of Wonder Stories must be open-minded on every possible change that may come along in the future. Whether these changes are good or bad, it is not for us to say. Sometimes it is a good thing to print a story which shows a horrible example how bad things might be if they were not checked.

If someone in 1927 or 1928 had come along and foreseen exactly the present depression, and would have shown us and guaranteed us the aftermath of our so-called inflation and stock market crash, perhaps we would have taken measures sooner to ward off the present catastrophe.

It is thus with Technocracy and all other forms of government. It is a good thing for the human being to know what he might be in for even if it never happens. It tends to sober us up and show us into what sort of foolishness it might get us into—Technocracy being one of them.

The point we wish to make here is that Wonder Stories will continue to show all phases of progress and supposed progress, whether the editor personally approves of such ideas or not.

The editor if he must do one thing must above all be open-minded. He must give every side its say.—*Editor*)

Proofs of Relativity

Editor, WONDER STORIES:

"Even the theory of relativity remained a curiosity until experimental evidence predicted by Einstein was found for it." This was the last sentence of comment on "Relativity and Reality" and the "Book Review" of Wonder Stories for April.

From remarks, comments and answers to readers in your various publications I acquired the notion that you are a man who takes everything with sizable grains of salt. And consequently that sentence was quite a surprise for me. It shows plainly that relativity is proved by experimental evidence and therefore is theory no more, but plain hard fact.

However there is still some free-for-all fighting going around about relativity. And there never was satisfactory experimental proof of it. It remains still a curiosity. It is true that Einstein predicted the bending of light rays around the sun, but it is also true that there are at least three different natural causes that bend or rather refract the rays in question, or otherwise affect the apparent position of stars on photographic plates.

It is impossible to show how much of bending is due to the gravitational field of the sun and how much to other causes. And it is very doubtful that the gravitational field of the sun has anything to do with that bending. The definite proof is lacking, in any event.

As much can be said for the advancement of the perihelion of Mercury's orbit. There are at least two causes that account for it in a satisfactory manner. Even the negative result of

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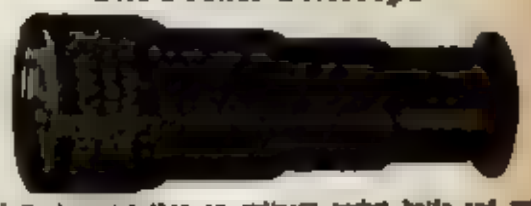
THIS season you can enjoy outdoor sports by carrying with you a handy pair of pocket binoculars or facilitate your laboratory work by using a microscope of more powerful design. Or you can even keep in your pocket a small telescope which will often come in handy.

POCKESCOPE
The Pocket Telescope



Not much larger than an ordinary pocket knife and yet it is a wonderfully powerful telescope. Easily focused and capable of enlarging a view many times. Finished in black crystallized lacquer with nickel trimming. Each instrument supplied with leather case. 6 Power, length closed 3¾", Diam. I 3/16". Price $2.00. 4-Power, length closed 3⅝", Diam. 11/16". Price $1.00.

ACHROMATIC TELESCOPE
6-Power

This instrument is the first telescope with achromatic lens system ever to be retailed at such a low price. Its magnification is six times. The draw tubes are of heavy brass, brilliantly nickeled, the body being of ribbed indestructible composition. Its field of view is 81 yards at 1000 yards distance, being 60% greater than that of other nonachromatic telescopes, while the detail and brilliancy of image are markedly finer, and entirely free from "rainbow" color aberration. The achromatic system gives a field of view that is flat and without distortion.
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The convenient size, simple manipulation and precise optical qualities of these Microscopes will appeal to biologists, chemists, geologists, dentists, physicians, laboratory workers and experimenters. Detachable base permits examining large and small objects. Single achromatic lenses, magnifies 40X, 75X, 100X and 110X, nontilting stand, height extended 8½". Chromium and black lacquer finish. Price complete with case, $10.00.
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This new book shows the human body with each aspect of its structure in separate sections; the exact position of all organs, every bone, muscle, vein, artery, etc.

LIST OF PLATES

Plate I. Nude Adult Female
" II. Nude Adult Male
" III. Nervous System of Female
" IV. Skeletal System
" V. Muscular System (Posterior)
" VI. Muscular System (Anterior)
" VII. Vascular System
" VIII Respiratory System
" IX. Digestive System
" X. Male Genital Organ in Detail
" XI. Female Genital Organ in Detail
" XII. Cross-Section of Pregnant Female Body with Child.

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THE READER SPEAKS

Michelson's experiments—experiments that started the trouble—is easily explained, thus making Fitzgerald's contraction entirely unnecessary and superfluous.

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S. Stoliaroff,
New York, N. Y.

(In the first place, we said nothing, in the article referred to, indicating that we accept relativity as "plain hard fact." We do not accept it as such. Our attitude, as we expressed it, is that the theory of relativity was a curiosity "until experimental evidence predicted by Einstein, was found for it." Now anyone recognizes that between a scientific curiosity and a scientific law there is a wide gap. The curiosity must become an accepted "theory," it must pass through the stage of an "hypothesis" and then may finally become a "law." It does not become a law while any evidence exists against it.

The relativity theory is a "theory" for which experimental evidence exists. That such evidence may be false, we do not deny. That it may be due to other causes, we do not deny. That many physicists quarrel over relativity, we do not deny. We even have some personal doubts as to the validity of the assumptions flowing from the Fitzgerald Contraction theory. But we do affirm that relativity is not today in the realm of a scientific curiosity. It is a scientific theory that has behind it a certain weight of evidence, and a large body of reputable physicists and mathematicians. We are perfectly open-minded on the question of the ultimate passage of the theory to the state of being a "law."

However, we would welcome from Mr. Stoliaroff some of the other explanations he refers to for the bending of light rays and the advance in the perihelion of Mercury.—*Editor.*)

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Eastleigh, Hants, England.

(This neat but brief compliment is sincerely appreciated, coming as it does from one of the birthplaces of science fiction. We have noted with a great deal of satisfaction the growth in our readers from England.—*Editor.*)

SCIENCE QUESTIONS AND ANSWERS

(Continued from page 66)

The dark body is supposed to be smaller in size than the luminous or visible one." In the course of their orbital revolutions, there will come a time when the smaller dark body will partially eclipse the luminous one. As soon as the eclipse is over the luminous body will regain full brilliancy. Thus the star appears to have a periodic variation of brilliance. This periodicity was described many years ago by Sir S. R. Ball, as follows: "For two days and ten hours the star remains of uniform lustre, being ranked about the second magnitude, then a decline of brightness sets in, and the star in a few hours parts with three-fifths of its brightness. At the lowest point it remains for about twenty minutes, and then the brilliancy commences to increase so that in a few hours more Algol has resumed its original character." Vogel was able to prove that the distance between the two bodies is 3¼ million miles, and the diameters 800,000 miles for the dark body and 1,100,000 for the luminous. Thus they are so close as to be in almost rolling contact. The combined mass of the two bodies Vogel found to be 2/3 that of our sun. Since Algol is 100 light years distant from us, the work of Vogel in determining so much about it is an illustration of the brilliance with which astronomers have solved many dark problems.—Editor.)

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BOOK REVIEWS

EXPERIMENTAL OPTICS by A. Frederick Collins, 310 pages, stiff cloth covers, illustrated. Size 5 x 7½. Published by D. Appleton & Co., New York. Price, $2.00.

The versatile Mr. Collins rounds out his series of experimental books by turning his attention to the fascinating question of light phenomena and how the amateur can experiment on it. The book begins with chapters on light as a part of our seeing. Shadows and the measurement of light come next. Then there are chapters on the bending of light rays together with the description of the exceedingly interesting instruments by which these bent rays are made valuable to man. Telescopes and microscopes are thoroly discussed. The marvels of color are treated. There is a chapter on strange, unusual lights, such as the eerie glows of the swamps, the cold light of the firefly, peculiar forms of illumination. The interference, the diffraction, the polarization of light are then discussed while a final chapter brings out some of the newer conceptions of light as related to electricity and magnetism. Interesting experiments which anyone can perform are included.

"WHAT IS TECHNOCRACY?" By Allen Raymond. 180 pages. 5 by 7¾". Published by Whittlesey House, New York. Price, $1.50.

Allen Raymond has been a reporter on the staff of the New York *Herald-Tribune* for several years, and as such brings to his study of Technocracy a slightly more racy and colorful picture of its history. He treats particularly of its history in its early stages when it was an informal group in Greenwich Village, with many now famous economists its forerunners.

It includes not only a vivid description of Howard Scott, drawn from his personal acquaintance with the newly-famous figure, but also a thorough critique and review of the bible of technocracy, Thorstein Veblen's "The Engineers and the Price System." An estimate of other "apocryphal writings," to use Raymond's words, a survey of the development of the Technocratic theory, and an analysis of its relation to the possible future life of the average American complete this rather dynamically written little book.

It was Mr. Raymond's series of articles in the *Herald-Tribune* that served to focus natural attention upon Howard Scott.

"TOWARDS TECHNOCRACY." By Graham A. Laing. 100 Pages. 6½ by 9½". Published by The Angelus Press, Los Angeles. Price, $1.50.

Almost every book which this reviewer has seen pertaining to that latest popular theory, Technocracy, has some special virtue to recommend it. In this case we feel that the special quality in this short work seems to endow it with a certain scholarly aroma, which none the less detracts not one bit from its interest. In tracing the development of society from a simple civilization into a more complicated organization due to the development of machinery, and as a result, capitalism, Professor Laing gives a splendid picture of both sociological and cultural changes, both as to customs and governmental functions.

There are also excellent surveys of the various proposed methods of reviving the dying state of capitalism. Professor Laing makes it quite clear that while we many understand the available essentials of Technocracy, and may picture the applications of its principles to American life, it is a highly complicated plan, and will not be so easily realized as most of its sponsors hope.

The photographs at the end of the book speak much more eloquently than could any writer, and contribute a great dramatic aid in convincing the average mind that machines have worked such tremendous changes in modern life that no mere stretch of time could remedy its present evils.

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This Partial Table of Contents gives you a faint idea of the value and the completeness of Dr. Wm. J. Robinson's wonderful new book, entitled:

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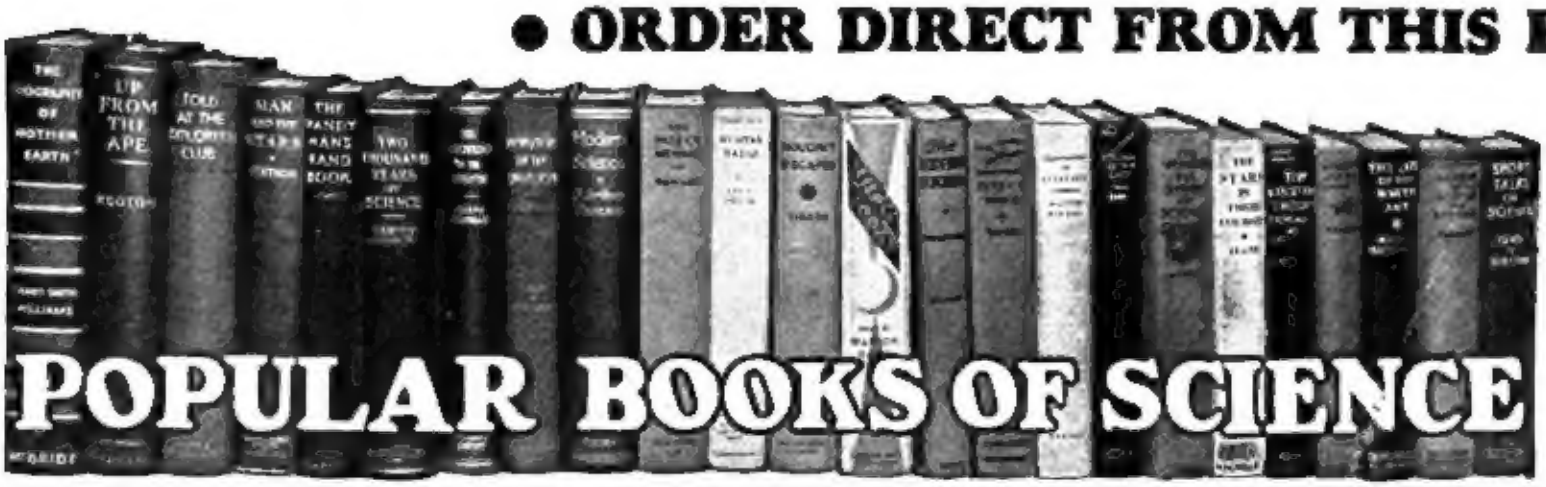

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NO HOUSE-TO-HOUSE CANVASSING
INCOME EQUAL TO REQUIREMENTS OF THE HIGH-GRADE BUSINESS MAN

E. Lawson, of Tennessee, clears **$108 profit his first 3 days** in this business. He tops off these earnings with **$113 profit on a single deal** a few days later. J. C. May, Connecticut, cleared **$262.35 the first 9 days he worked.** J. E. Loomis, Oregon, earns **$245 his first 9 days.** A. W. Farnsworth, Utah, nets **$64.16 his first day,** a Saturday. S. Clair, New York, writes he is clearing as high as **$70 a day.** W. F. Main, Iowa, cleans up **$291.50 in 9 days.** B. Y. Becton, Kansas, starts out with **$530.53 net for 40 days' work!** These men are beginners. How could they enter a field totally new to them and earn such remarkable sums in these desperate times? *Read the answer in this announcement.* Read about a new business that does away with the need for high pressure selling. A rich field that is creating new money-making frontiers for wide-awake men. *Those who enter now will pioneer — to them will go the choicest opportunities.*

FOUR $15 SALES DAILY PAY $280 WEEKLY

INSTALLING NEW BUSINESS SPECIALTY ON FREE TRIAL—MAKING TREMENDOUS CASH SAVINGS IN OPERATING COSTS FOR THOUSANDS OF CONCERNS THROUGHOUT THE U. S. and CANADA

$4,707 SAVINGS FOR ONE KANSAS STORE IN TWO MONTHS

Sanders Ridgeway of Kansas invests **$88.60 and saves $4,707.80** between April 5th and June 29th! Bowser Lumber and Feed Co., West Virginia, **invests $15,** report savings well over **$1,000.00!** Fox Ice and Coal Co., Wisconsin, **save $3,564.60!** Baltimore Sporting Goods Store **invests $45, saves $1,600.60!** Safety Auto Lock Corporation, New York, **invests $15, saves $686.45!**

With these and scores of similar results to display, our representatives interest every business man, from the very smallest to the very largest. No one can dispute the proof in the photo-copies of actual letters which our men show.

NO HIGH PRESSURE —SIMPLY INSTALL— SELLS ITSELF

Here is a business offering an invention so successful that we make it sell itself. Our representatives are now instructed not to attempt any selling whatsoever! They simply tell what they offer, show proof of success in every line of business and every section of the country. **Then install the specialty without a dollar down.** It starts working at once, producing a cash saving that can be counted just like the cash register money. **The customer sees with his own eyes a big, immediate profit on his proposed investment.** Usually he has the investment, and his profit besides, before the representative returns. The representative calls back, collects his money. OUT OF EVERY $75 BUSINESS THE REPRESENTATIVE DOES, NEARLY $60 IS HIS OWN PROFIT! THE SMALLEST HE MAKES IS $5 ON A $7.50 INSTALLATION! And the deal has been made without toil and trouble, without high pressure, without drudgery, without argument! **Nothing is so convincing as our offer to let results speak for themselves!** While others fail to even get a hearing, our men are making sales running into the hundreds. They are getting the attention of the largest concerns in the country, and selling to the smaller businesses by the thousands. **Business is GOOD, in this line, in small towns or big city alike! It's on the boom now. Get in while the business is young!**

START ON SMALL SCALE

You can start small and grow big. This is the field that the young man should enter and grow with. The mature man has the seasoning of experience which is worth thousands in this business. **You can get exclusive rights.** With profits from your first business you can open an office, hire salesmen, branch out into open territory where available, after you get going. Exclusive contract enables you to build an established permanent business which can be sold like any other business. Give your customers satisfactory service and they will be your prospects for repeat orders as long as they are in business. **You can pay your salesmen double what they make in ordinary lines, and yet have a big margin left for yourself.**

COMPLETE TRAINING FURNISHED

Every man with us today started at scratch, without previous experience, many coming out of clerking jobs, many out of small businesses, some out of large concerns. We teach you every angle of the business. We hand you the biggest money-making business of its kind in the country. You try out this business, ABSOLUTELY WITHOUT RISKING A RED COPPER CENT OF YOUR OWN. Can't possibly tell you all in the limited space available here. Mail the coupon now for full information — **nothing to risk, everything to gain.**

A BRILLIANT RECORD OF SUCCESS

America's foremost concerns are among our customers: Timken Silent Automatic Co., Central States Petroleum Corp., Acme Iron and Steel, Great American Life Underwriters, Houghton-Mifflin Co., National Paper Co., International Coal, Street Railways Advertising Co., General Brake Service, National Radio, and scores of others nationally known. Thousands of small businesses everywhere, professional businesses, such as universities, newspapers, hospitals, infirmaries, doctors, etc., buy large installations and heavy repeat orders.

CUSTOMER GUARANTEED PROFIT

Customer gets signed certificate guaranteeing cash profit on his investment. Very few business men are so foolish as to turn down a proposition guaranteed to pay a profit, with proof from leading concerns that it **does pay. Protected by surety bonded national organization.**

PORTFOLIO OF REFERENCES FROM AMERICA'S LEADING CONCERNS

is furnished you. A handsome, impressive portfolio **that** represents **every** leading type of business and profession. **You show immediate, positive proof of success.** Immediately forestalls the argument, "Doesn't fit my business." Shows that it does fit, and does make good. **Closes the deal.**

RUSH THE COUPON FOR FULL INFORMATION

TERRITORY FILLED IN ORDER OF APPLICATION

If you are looking for a man-size business, free from worries of other overcrowded lines of work, get in touch with us at once. Learn the possibilities now before the franchise for your territory is closed. This specialty is as important a business opportunity today as the typewriter, adding machine, and dictaphone were in their early days. Don't lose valuable time, and let this slip away from you. **Use the coupon for convenience. It will bring you full information and our proposition immediately.**

MAIL FOR FULL INFORMATION

F. E. ARMSTRONG, Pres., Dept. 4058-D, Mobile, Ala.

Without obligation to me, send me full information on your proposition.

Name.....

Street or Route .....

Box No.....

City .....

State .....

F. E. ARMSTRONG, President, Dept. 4058-D, MOBILE, ALA.